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The Acquisitions Librarian as Change Agent in the Transition to the Electronic Library

Ross Atkinson

All information services, regardless of the format used to convey the information, can be divided into the two fundamental categories of delivery and mediation. Delivery is the less visible but no less critical service responsible for shifting the physical information package among different locations. Delivery will become an increasingly significant—but no less invisible—function after the arrival of routine electronic publishing. Acquisitions administrators—who, along with circulation, interlibrary loan, and preservation officers, have primary responsibility for delivery in the paper-based academic library of today—need to begin planning now to expand their knowledge and responsibilities to respond to the new requirements for information delivery in the rapidly approaching age of networked information. If they can achieve such objectives, acquisitions staff will play a key role in improving the future contributions of the library to the academy.

> If there is any period one would desire to be born in, is it not the age of Revolution; when the old and the new stand side by side and admit of being compared; when the energies of all men are searched by fear and by hope; and when the historic glories of the old can be compensated by the rich possibilities of the new era? This time, like all times, is a very good one, if we but know what to do with it.
>
> —Emerson, *The American Scholar*

Anyone seeking a quick, concentrated glimpse into the current state of the academic library, its self-esteem and its self-deprecation, its hubris and its paranoia, need look no further than the library's acquisitions operation.[1] The place and image of the library in the institution is mirrored in the position and perception of the acquisitions operation in the academic library. In both cases, as Joe Hewitt has implied,[2] we find complex responsibilities seldom understood by those in authority and perceived by most clientele (if indeed they are noticed at all) as being primarily clerical and flagrantly bureaucratic. We find, above all, in both the acquisitions operation and the library as a whole, a vague apprehension of a creeping superfluity, a sense of pending obsolesence engendered primarily by advances in information technology so rapid in their development and so complex in

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their potential as to be barely intelligible to many line librarians. Discussions of this situation are often complicated by a tendency to confuse functions with administrative units. The function of acquisitions is for the time being not at all in jeopardy, but the acquisitions department might be, and we have indeed seen transformations in such departments in several institutions; in some cases we have even seen parts of the traditional acquisitions responsibility shifted into other functional areas, such as collection development. In the same way, the information services function in the academy now performed by the library can never be eliminated if the institution is to pursue its educational and research mission, but there are prospects that at some institutions the library as an administrative unit will merge with or be relegated to other information service units on campus, such as academic computing.

Regardless of whether such administrative reorganizations enhance or impair the performance of library functions, the fact that such restructuring is even considered presents a clear signal that acquisitions may have failed to convince the library—and that the library may have failed to convince the institution—of its ability effectively to meet the needs of its clientele as we gradually but inexorably enter the new era of online information. The question that immediately presents itself, therefore, is whether adjustments might be introduced into the acquisitions function that would not only lead to an improvement in its role in the library but at the same time improve the effectiveness of the library's contribution to the institution. The purpose of this paper is to present some general ideas and tentative suggestions that, I hope, will serve as a basis for further discussion on this issue.

FUTURE PROSPECTS

We have in recent years witnessed a small but growing number of standard information sources published in electronic form. This shift from paper to electronic publishing has so far had its primary impact in public services, especially reference and collection development. This is because many such electronic sources either are directly accessible to users or public services staff over networks or are shipped to libraries as computer files in such forms as CD-ROMs or tapes, so that they can be managed by acquisitions operations in somewhat the same way that traditional paper sources are treated. No one will doubt, however, that the point is rapidly approaching at which an increasing amount of full-text information will be made routinely available to libraries and their users by transmission over networks, and it is that inevitable innovation—its approach now already heralded for decades—which upon finally arriving will have the most profound effect on all aspects of library operations, including especially the acquisitions function.[3]

The question acquisitions administrators need to consider is whether they plan to continue simply to maintain their current focus, retain their present methods, and restrict their responsibilities to those paper (or paper-like) publications that will no doubt continue to be published for some time (this is fully possible, since one could presumably bypass acquisitions in ordering access over networks to online sources) or whether the acquisitions function should be prepared to undergo some radical, fundamental alteration, so that it would gradually begin to play, with respect to networked information, a role analogous to that it now plays in the provision of information transferred via paper. There is still time for acquisitions to begin to plan for such a transformation. The development of electronic publishing has for several reasons not evolved nearly as quickly as was once predicted.[4] But electronic publishing is nevertheless making noticeable progress, and it is likely to move forward very rapidly and very suddenly once it gains momentum and a critical mass of user acceptance. While opportunities remain, therefore, to adjust to, and to take advantage of, these rapidly evolving developments in the techniques of information exchange, we are probably approaching the eleventh hour.

We now have available to us a variety of well-conceived predictions about the future of the library as publications become increasingly available online.[5] These discussions are very useful in preparing ourselves for the changes we must shortly confront; however, it is important to bear two further points in mind. First, more precise projections of the conditions of libraries in the coming decades can be little more than exercises in pure speculation, which are, for the most part, not helpful in planning, especially given the restricted time we have available to spend on such work. Second, well-managed planning, if successful, is not simply an effort to prepare for future events; it should also be an attempt to shape them: by considering and readying ourselves for the future, we can and probably will change it. It is essential, therefore, that any planning we do leaves us with broad flexibility to absorb and to take advantage of unforeseen future developments while at the same time provides us with some kind of clear framework within which, or target toward which, we can orient ourselves in the course of the transition. One way to begin this process is to agree upon a general description or model of the whole operation—in this case information services—that is applicable to both the present and the probable future condition. Such an abstract model can be used as a context within which to make adjustments to the concrete conditions or activities now in place, in order to move the operation through the transition toward the preferred future. Creating such a description applicable to both the present and the probable future is in a sense simply a way of looking at the present and future simultaneously as we begin to make our adjustments: if one changes or upgrades activities or concepts, and these continue to fit into the model, then one is probably moving in the right direction. Let us therefore attempt this—but first we need to insert two presuppositions.

TWO PRESUPPOSITIONS

THE POTENTIAL PRIMACY OF NOTIFICATION SOURCES

Graphic information is communicated in many formats for a wide variety of purposes. Many categories of information sources—belles lettres, for example—will almost certainly continue to be published in paper form well into the future, and the relationship between those materials and the library's acquisition function will presumably remain unaltered for some time. We have recently become aware, on the other hand, that certain types of information sources are particularly amenable to electronic publication—for example, bibliographic files and numeric data. The next major advance will presumably be the routine publication online of narrative full text. Of the various types of sources for which the academic library is responsible, it will most probably be the large category of library materials that I have elsewhere called *notification sources*,[6] which will be published increasingly in full-text electronic form in the near future and which will be likely to have the most significant impact on library operations. Notification sources are those materials written by scholars to describe the results of their research and thought for the information and assessment of other scholars working in the same or related fields. Most scholarly journal articles and monographs fit into this category, and there have recently been repeated calls from scholars, librarians, and network administrators to publish more information of this kind in electronic form.[7] It is in notification sources that the greatest opportunities for online scholarly communication should be available.[8] The delay in routinely publishing most notification sources online surely derives less from any limitations of technology than from cultural habits and the economics of publishing. Once these two (admittedly substantial) impediments are bypassed or moved aside, as they must eventually be, the floodgates will open, and we will experience a deluge of online scholarly publications, which some institutional agency—one hopes it will be the library—will need to ensure are available to scholars. Most of these publications, at least in the beginning, will probably be electronic journals, many of them no doubt in the sciences.[9] But the other scholarly disciplines will not be far behind, because all subjects will benefit so demonstrably from remote access at personal workstations to the latest published information.

For reasons of convention, aesthetics, and ease of access, we may expect that monographic publications will continue to be published in paper form for a somewhat longer period than their journal counterparts, but we must anticipate that the scholarly monograph as well will succumb to online publication in the relatively near future.[10] It may be that the scholarly monograph will be replaced by some form of online monograph, or that lengthier materials will be published in digital form with the expectation that they will be printed by or for the library user on site and on demand, or even that the monograph as a method of scholarly communication will be replaced by shorter essays more conducive to publication as electronic journal articles. In any event, the driving force behind the replacement of the paper monograph by some online form of publication will undoubtedly be primarily economic. The publication of lengthier studies on highly specialized subjects, especially in those disciplines without industrial or commercial applications, is already becoming so expensive as to be prohibitive. I suspect in fact that there has seldom been enough of a true demand for such specialized monographic notification sources to justify their publication economically. We have perhaps succeeded so far in circumventing this problem primarily through the agency of the academic library, which creates a kind of artificial demand for specialized scholarly publications. Under the current system of collection development, the library imputes a use-value to materials for which no actual use-value has been demonstrated. The library purchases the publication on the basis of that potential use-value (or on the assumption that the publication by virtue of its availability on the shelf will acquire use-value). As a result, enough of a reliable demand of this kind presumably exists to permit publishers to bring out short runs of highly specialized monographic publications. The pressures on library budgets in recent years (caused in part by rapidly inflated journal prices), however, have now become so paralytic in their effect that some libraries can no longer afford to acquire materials based on potential—as opposed to demonstrated or expressed—use-value. Since a reduction in publication costs appears unlikely, it may well be that only through some form of restructuring of the scholarly publication process will it remain possible economically to communicate such specialized information for very much longer in lengthier publication formats.

In light of these considerations, therefore, let us restrict our inquiry, at least initially, to services promoting the exchange and use of notification sources published electronically.

THE INCLUSION OF INPUT

The purpose of notification sources is, obviously, scholarly communication. Communication entails the transmission and the reception of information—input and output. Modern libraries have restricted their responsibilities mainly to the reception—or, more precisely, to the facilitation of the reception—of information, leaving responsibilities for transmission for the most part to other agencies, mainly publishers. This has always been a potentially problematic approach to the promotion of scholarly communication, because transmission and reception are so fundamentally interdependent. If the library intends to continue to play a key role in scholarly communication in the online age, therefore, it must be prepared to assume some responsibility itself for ensuring that the entire scholarly communication system operates effectively—and that must necessarily include input.

The need and the potential for the academic library to play a much greater role in publishing as we move further into the online era is by now a relatively common idea.[11] Little has been done so far, however, to chart the processes by which such responsibilities might be assumed. At this point, we need only stress two implications of such an expansion of the library's traditional activities. First, if such new responsibilities are to be accepted by the library, a key role in that undertaking will need to be played by those library staff with the most advanced understanding of the processes and economics of publication—and those staff will for the most part be located in our acquisitions (and also collection development) departments.

The second implication is mainly economic. If the library does assume greater responsibility for assisting and promoting the entire process of scholarly communication, much of which is achieved primarily through notification sources, then the present methods of funding that communication must soon be recognized as ineffective. We must bear in mind that scholarly communication is an admittedly slow but nevertheless progressive dialogue. Scholars read publications primarily to write more of them—to continue the conversation. (Much more "interactive" publication will no doubt become possible online.) Both sides benefit from the dialogue: not only the reader, but also the author and his or her institution. (The institution's primary "product" or "commodity," which is sold to prospective students and to funding agencies is, after all, the reputation of its faculty—and that reputation is established mainly through publications.) Most of the readers and writers of notification sources are, moreover, the clientele of academic libraries. Under such circumstances, we must conclude that our current funding methods for notification sources are largely counterproductive. We will be wasting our money—and in a very real sense we are already doing so—buying information (packaged as notification sources) from each other. Instead, we should be using that funding to send such information to each other. Libraries must maneuver themselves into a position from which they will be accepted as credible and legitimate conduits for the transmission of notification sources.[12] Needless to say, such a shift in the method of scholarly communication raises many questions, but there is no doubt that academic libraries are fully capable of putting such a system into effect and that such an arrangement managed by the library would promote the interests of scholarly communication substantially. It would also, if properly managed, bring about a much more egalitarian distribution of scholarly information.

Having posited our two presuppositions, we may now turn to our primary task of presenting a general description of information services.

THE DIALECTIC OF INFORMATION SERVICES

Information services are those facilities designed to improve the ability of (in the sense of reducing the time required by) the individual client to identify, organize, transmit, receive, exploit, and develop and maintain standards for communications, usually in the form of sets of graphic signs, for predefined purposes. In the academic library, those purposes are for the most part education and research.

The basis of our description will be a division of information services into two fundamental functional categories. The first of these two functions, which we will call *delivery*, is charged with the transportation or conduction of the material information package or carrier; the other function, which we will call *mediation*, is designed to assist the sender and receiver of the package in the transmission, receipt, and application of the so-called information content of the package.[13] Together these functions form a kind of dialectic of information services, so that one cannot in reality be disconnected from the other. At the more elementary level, it is obvious that mediation, in order to achieve its function, must play a role in the delivery process—it must, for example, take economic issues into account in document assessment and consider location as part of the process of identification. By the same token, delivery can seldom be effectively achieved without some understanding of or reference to the content, and the needs of the communicants—i.e., the senders and receivers of the information—must be understood by those responsible for delivery if, for example, effective priorities for delivery are to be established.

On a more fundamental level, the dialectic reduces perhaps most clearly to the realization that all communication could and might be understood as a form or process of delivery. The package and the content are both primarily means of delivery. The medium is selected by the communicants through a kind of mutual agreement that such a medium provides the best prospects for delivery, and that decision will be driven or conditioned by the relative delivery potential of different media. Even the capacity, which most electronic media now provide the user, to manipulate the data received—that, too, can and must be understood in a sense as a delivery function, for the data needed by the receiver are in effect made deliverable and are delivered by means of that manipulation. The user in effect through manipulation creates and delivers the data for his or her own use. Mediation itself can in fact be understood—and must sometimes be viewed—as that segment of information services responsible for ensuring and enhancing delivery.

We could, of course, expand on these connections indefinitely. The only important point is that, in the heat of our efforts to divide information services into these two types of activities, we not lose sight of the fact that such categorical distinctions as delivery and mediation are always artificial abstractions. We can no more separate delivery from mediation than we can divide transmission from reception: each is understandable and practicable only as an extension of the other. At the operational level, however, it does appear very likely that some staff in the electronic library will specialize in delivery and others in mediation.

Both delivery and mediation are, of course, services in themselves, designed to serve the needs of the communicants. Both delivery and mediation are also concerned with the material containers of information—albeit in very different ways. This is, again, as true in the electronic environment as it is in the paper environment. It is admittedly sometimes tempting to view information exchange in electronic form as something done "without having to rely on tangible physical objects as the medium of communication . . . ."[14] This is, of course, incorrect. All communication is achieved through some kind of material media. In the case of online communication, those media are difficult to observe and they can be moved about very quickly, but they remain nevertheless material objects, and their transmission and reception remain material manipulations.

We must be careful to distinguish, therefore, between: (a) the carrier or what we are calling the information package (e.g., a book or a database); (b) the content of the package, which most often consists of linguistic or pictorial symbols (e.g., the print on the page or on the screen), which is, of course, also material; and (c) the information symbolized by the content, which is encrypted (encoded, turned into symbols) for purposes of communication by the writer and decrypted by the reader. Bearing in mind that these three entities are, of course, also inseparably interdependent, we might say that, in the grossest possible terms, the responsibility for managing the carrier or package belongs in large part to the delivery operation; the content forms in many ways the central focus of mediation; while the information itself must always be the primary concern and responsibility of the communicants.

We can best begin to distinguish delivery services from mediation services by differentiating their respective relationships to the information package and to the user. Delivery is primarily a logistical operation aimed at the transportation of the package or carrier from one location to another. The material nature of the package, its physical composition, is of critical importance to the delivery operation, because it has the most fundamental effect on the package's portability. It is in general much easier (or, at least, much faster) to move information packages from one location to another in electronic form than in paper form. Regardless of the package's physical composition, however, delivery requires a thorough knowledge of the technology of transmission as well as an experienced understanding of many of the peripheral factors—administrative, economic, legal—upon which the successful movement of the information package depends.

Mediation, on the other hand, is primarily a linguistic or hermeneutic operation, designed to optimize or amplify the exchange of information among the communicants; this service reduces in most instances to assisting the writers and readers in making different kinds of selection decisions: what and how to transmit, what to receive and what to filter out, how to search, what uses to make of the information once it is obtained. While delivery is concerned more with the transportation of the information package (which may admittedly sometimes involve some transcription of the content), mediation must concentrate more upon assisting in the translation of meaning into material symbols, and of the material symbols into applicable meaning. This requires knowledge of the needs and interests of the communicants, as well as the methods of identifying and interpreting information packages. Delivery services work primarily with matter "out there" in the material world (including, increasingly, segments of electronic databases); their activities, operations, and success are for the most part objective, public, and measurable. Mediation services, on the other hand, while also working admittedly with material content, are nevertheless designed to facilitate private, subjective activities—writing, reading, evaluating, interpreting, applying—which are neither observable nor precisely measurable.

In spite of their relatively observable activities, however, delivery services are normally separate from, and seldom observed by, the communicating clientele. That aspect of information services that is de facto public, in other words, and that could be objectively evaluated is paradoxically seldom even perceived, let alone evaluated by the public. Mediation, on the other hand, is subject to constant scrutiny and aggressive public assessment. Even though delivery operations in the traditional paper environment are already barely visible to most library users, such services in the online environment have the potential to become even more obscure. How often have we heard it said that in the online environment, it makes no difference where the information is located: the user can gain access to it over the network regardless of its location? This is indeed true, provided that those invisible technicians and information service specialists responsible for delivery have done and continue to do their work. The extensive technical and administrative effort invested to provide such immediate access to large volumes of information in different locations remains relatively unnoticed by most users—unless, of course, the system malfunctions.

This also means among other things that delivery services always function as a kind of direct representative of the user. Delivery services act for the communicants in their absence, and carry out their presumed bidding, in effect making decisions for them. One of the major liabilities of delivery services, therefore, to which we have already made reference, is that delivery staff can for this reason alone easily become detached from the clientele in whose interest they are charged to operate. Mediation services, on the other hand, can seldom if ever act entirely for the communicants but rather must work frequently in their presence as (often very much less than equal) partners. Precisely because mediation services depend for their success on a close coordination with the user, they are highly visible and are subject to all of the benefits and liabilities of that exposure. It is mediation services, moreover, that always have functioned as the library's link to the user and will no doubt continue to do so.

We must also distinguish between our two basic services at the economic level. Mediation services, with various degrees of input from the communicants, try often to assess the value of information from the perspective of utility or use-value. The willingness to pay the cost of the transmission and receipt of the document depends upon how much (i.e., how fast) that access is needed by the receiver. Delivery services, on the other hand, tend to view the value of the document more in terms of its exchange-value or market value—i.e, in financial terms. The value of the document or package is assessed or inferred mainly by comparing it as a material object to other packages of like quality, origin, and design. Thus, while mediation services are more inclined to view scholarship as a form of specialized communication and documents as products of research to be communicated, delivery services tend perhaps to view the document more as a commodity and scholarly information exchange more as a specialized form of commerce. This tendency is perhaps one further manifestation of the fact that delivery services are accustomed to objectivity and relatively exact measurement, while mediation services understand their operation as promoting primarily subjective and relatively private action.

We should also note, finally, that the citation of an information package—its bibliographic surrogate—may refer to different concepts in delivery than in mediation. While the citation for mediation purposes is used mainly to characterize or identify the content as it relates to the content of other documents, the citation for purposes of delivery is used mainly as a means to determine where the document is or could be physically located and perhaps where it should be sent—in other words, a kind of address. What the document is about—in the sense of what its content refers to—is for the most part irrelevant to delivery services, except to the extent that it can serve as an indication of its origin and destination.

In order to examine these concepts further, let us resort to a diagram that summarizes the distinctions we have been discussing but that also retains at the same time the terms we use now in the primarily paper environment (see figure 1).

The broken vertical line between input and output today separates also the library's responsibilities on the output side from those of the publisher, who is now primarily responsible for input. As noted earlier, at least as far as notification sources are concerned, which are both written and read primarily by the clientele of academic libraries, there is no reason, especially in the online environment, not to expand the library's role in information services to include input—to fuse more effectively the inputting and outputting operations. Even in the primarily paper environment, as already noted, we pay dearly for this unnecessary and highly contradictory division of responsibilities. Our goal, therefore, must be not simply to add input responsibilities to those we already have for output, but also in so doing to bring about a closer coordination or consolidation between the two.

This is admittedly perhaps most demonstrably practicable in the diverse realm of mediation. Certainly the library has the potential, and should assume much more responsibility for, assisting and organizing the editing or input-filtering function. Much more is being published today than needs to be for purposes of scholar-

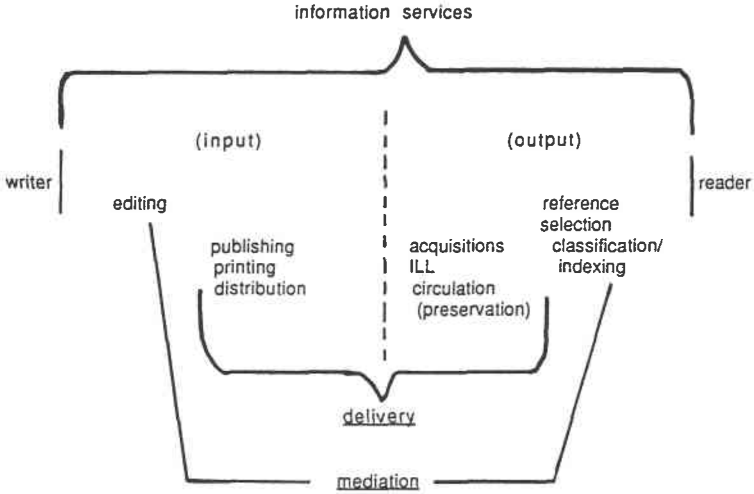

Figure 1. Structure.

ship, because, among other things, there is an inadequate system of quality control.[15] Working with scholars to establish standards and procedures for editing notification sources should be a fundamental library service, which should aim to bring about a much more effective and dependable quality control over scholarly communication. But we must also strive to combine what are now conceived primarily as outputting responsibilities with inputting activities. This is especially needed in selection and in cataloging and indexing. An integral aspect of the selection responsibilities for notification sources should be the influencing and assisting of what gets published; part of selection activity, in other words, as a mediation service, should be to work closely with scholars to select those writings that should be made public through standard channels and to determine the levels of access that should be provided for different publications. The classification and indexing of notification sources should also properly be done by the library—again, as a mediation service, that is, in partnership with the author at the inputting stage. When the library transmits (i.e., publishes) a notification source, the cataloging or indexing should be part of, or one further form of, that publication. As mentioned earlier, collection development funding budgeted for notification sources should be used at least partially for inputting, i.e., for transmitting those sources to other libraries for the use of scholars elsewhere.

Such an amalgamation between input and output should also occur in the area of delivery services. Those staff responsible for receiving transmissions—or for ensuring that such transmissions are available to local scholars—should be the same staff responsible for the transmission of the work of local scholars to other institutions—or at least for ensuring that other institutions can effectively request and receive such transmissions on demand. In this way, we can guarantee critically important uniform standards and procedures in the online exchange of notification sources, much as we have succeeded to a limited extent in achieving such standardization today in interlibrary loan.

We must bear in mind, finally, that delivery not only is concerned with the movement of information into and out of the institution for research purposes, but is also responsible for the transportation of information within the institution for instructional purposes. Information, for example, "scattered throughout the library can be brought together or interconnected to form a useful collection for teaching and learning purposes. These facilities can be supported by not only the library but also the computer center and offices of instructional development on campus."[16]

BEYOND NOTIFICATION

Although we have restricted our discussion to notification sources, we must also pay at least some passing attention to the fact that other sources will also become increasingly available online in full text, although not as quickly, I suspect, as current notification sources. One very large body of potential online information, which may well become prevalent shortly after the initial emergence of notification sources, consists of materials previously published in paper form but later digitized. The purpose of such digitization may be preservation, storage, or simply improvement of access. Whatever the purpose, we must expect large numbers of digitized documents eventually to replace their paper originals at most of our institutions. These digitized items will be transportable over networks to readers throughout the country and the world. The direct intervention of libraries in this transfer of information might possibly be less necessary, although the screening or selection skills of mediation will very probably remain essential services. In any event, such transfer will be impossible without not only technical innovations but also complex economic and political negotiations. Creating and maintaining an infrastructure that can promote and link such innovation and negotiation must be the responsibility of delivery services. Once again we find the special skills of delivery staff in clear demand: technical and administrative knowledge and skills, not to mention an understanding of the

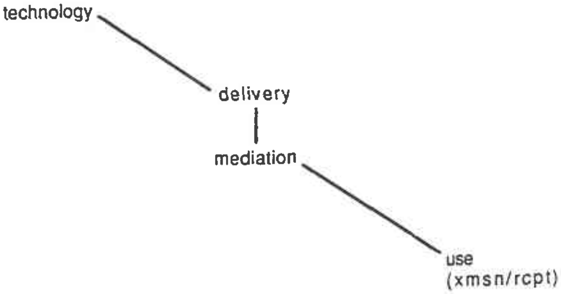

Figure 2. Coordination.

such a structure is not only to manage the logistics of the transmission and reception of graphic information for the institution, but also in so doing to represent the needs of scholarly communication to the technical arm of information services and to convey the technical capacities and options, including their administrative and economic advantages and perquisites, through the agency of mediation services, to the scholarly user community. Delivery services would function in such a capacity as a kind of regulatory mechanism within the national system of scholarly information exchange, which would define what material forms of exchange are technically available and economically feasible. This service, if well managed, would have the most beneficial effects for the communication of scholarly information in the online era, for the service contribution of the library to the institution, and, needless to say, for the position of delivery services within the library.

Despite the forward-looking philosophies adopted by a small number of acquisitions departments, few operations in the academic library today appear as ill-prepared as acquisitions for the advent of online information exchange. Certainly no operation will be more profoundly affected by that development than acquisitions. No operation has so much to lose by deferring such preparation or so much to gain by beginning now to plan and to implement whatever functional changes are needed to accommodate and to exploit these opportunities. If acquisitions does not assume these responsibilities, they will certainly be absorbed by other agencies in the information services community, probably ultimately to the detriment of scholarly communication.

REFERENCES AND NOTES

1. I will be using the term *acquisitions* to refer to those library functions responsible for the ordering and receipt of library materials in all formats, including serials.
2. Joe A. Hewitt, "On the Nature of Acquisitions," *Library Resources & Technical Services* 33:107 (1989).
3. See *Managing a New Library Resource: Results of the RLG Machine-Readable Data File Project in Six Member Libraries* (Mountain View, Calif.: The Research Libraries Group, 1989). For a recent, very adaptable effort to integrate electronic publications into the current academic library, see Paul Metz and others, *Report of the Task Force on the Electronic Journal* (Blacksburg, Va.: University Libraries, Virginia Polytechnic Institute and State University, 1991).
4. Participants in a 1980 Delphi study, for example, predicted that "25% of existing reference books will be available only in electronic form" by 1990. Reported in F. W. Lancaster, *Libraries and Librarians in an Age of Electronics* (Arlington, Va.: Information Resources Press, 1982), p.61.
5. The classic work remains F. W. Lancaster, *Libraries and Librarians in an Age of Electronics*. For a more recent discussion by Lancaster see his "Electronic Publishing"

in *Library Trends* 37:316–25 (1989). For a recent critique of Lancaster's position, see Svend Larsen, "The Idea of an Electronic Library: A Critical Essay," *Libri* 38:159–77 (1988). For a summary of different perspectives in the published literature, see Meredith Butler, "Electronic Publishing and Its Impact on Libraries: A Literature Review," *Library Resources & Technical Services* 28:41–58 (1984). For a selected bibliography on electronic publishing, see Barbara M. Robinson, "Managing Change and Sending Signals in the Marketplace," *Library Acquisitions: Practice & Theory* 13:223-25 (1989). The best recent overview is certainly David W. Lewis, "Inventing the Electronic Library," *College & Research Libraries* 49:291–304 (1988).

6. Ross Atkinson, "Old Forms, New Forms: The Challenge of Collection Development," *College & Research Libraries* 50: 514–15 (1989).
7. For a very recent example of such a call to publish more online, see N. David Mermin, "Publishing in Computopia," *Physics Today*, 44:9–11 (May 1991).
8. See Brian J. Perry, "The Impact of Electronic Publishing on Library Collection and Services," *IFLA Journal* 14:129 (1988).
9. See Lewis, "Inventing the Electronic Library," p.296:

   > Disciplines where the results of research can be separated from the reporting of results will find the transition easier than disciplines where a large part of the scholarly task is the expression of understanding. A biochemist receives a Nobel Prize for work done in the lab, but a historian will receive a Bancroft, not for work in an archive, but only for a book.

   See also Eric Wainwright, "The University, Its Library, and the Information Age," *Australian Academic & Research Libraries* 16:75 (1985).
10. Michael Gorman would disagree. See his view on the future of the monograph in his "The Academic Library in the Year 2001: Dream or Nightmare or Something In Between?" *Journal of Academic Librarianship* 17:7 (1991).
11. See, for example, Edwin Brownrigg, Clifford Lynch, and Mary Engle, "Technical Services in the Age of Electronic Publishing," *Library Resources & Technical Services* 28:67 (1984). More recently, see Peter S. Graham, "Electronic Information and Research Library Technical Services," *College & Research Libraries* 51:249 (1990). The Coalition for Networked Information has established a Working Group on Non-Commercial Publishing, which is considering among other things how institutions can be assisted in undertaking more electronic publishing.
12. See Patricia Ohl Rice, "From Acquisitions to Access," *Library Acquisitions: Practice & Theory* 14:18–19 (1990). See also Eldred Smith's idea of a centralized "electronic collection" for the use of all research libraries in his "Resolving the Acquisitions Dilemma: Into the Electronic Information Environment," *College & Research Libraries* 52:236 (1991).
13. See Clyde Hendrick, "The University Library in the Twenty-first Century," *College & Research Libraries* 47:128 (1986), who divides the user's task in the coming online age into two parts: (a) mastery of the physical means of getting at the information and (b) mastery of the conceptual systems for the organization of the library's store of knowledge.

    See also Gorman, "The Academic Library in the Year 2001," p.6:

    > The purpose of libraries is, and always has been, twofold: (1) to acquire, store, disseminate, and allow access to carriers of knowledge and information in all forms, and (2) to provide services based on those carriers of knowledge and information. The fact that there are now new carriers and new technologies ('twas ever thus) has not changed that enduring purpose one whit.
14. Gordon B. Neavill, "Electronic Publishing, Libraries, and the Survival of Information," *Library Resources & Technical Services* 28:76 (1984).
15. See Carolyn J. Mooney, "Efforts to Cut Amount of 'Trivial' Scholarship Win New Backing from Many Academics," *Chronicle of Higher Education*, May 22, 1991, p.A1, A13, and her "In 2 Years, a Million Refereed Articles, 300,000 Books, Chapters, Monographs" on p.A14 in the same issue.
16. Deanna L. Roberts, "Needs-Led Service Not Acquisitions-Led Service in the Research Library," *Collection Building* 11, no.1:24–25 (1991).
17. See, for example, Forest Woody Horton, Jr.'s idea of "The Emerging Information Counselor," *Bulletin of the American Society for Information Science* 8, no.5:16-19 (June 1982).
18. "Interaction with the environment" is one of the seven major issues relating to the

successful adaptation to change identified by G. Edward Evans in his "Research Libraries in 2010," in *Research Libraries, The Past 25 Years, The Next 25 Years: Papers for a Festschrift Honoring Le Moyne W. Anderson* ed. Taylor E. Hubbard (Boulder, Colo.: Colorado Associated University Press, 1986), p.77–94.

19. See Martin Faigel, "The Library as Marketplace in a Collection Management Environment," *Library Acquisitions: Practice & Theory* 12:194 (1988). Academic libraries have so far often been less than successful in influencing decision-making on technology at the institutional level. See, for example, Kenneth E. Flower, "Academic Libraries on the Periphery: How Telecommunications Policy is Determined in Universities," *Journal of Library Administration* 8, no.2:93–114 (Summer 1987).

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JOHN P. COMAROMI
1937–1991

John P. Comaromi, Editor of the *Dewey Decimal Classification* (*DDC*), died suddenly on November 6, 1991, at his home in Bethesda, Maryland.

Comaromi served as Editor of the *DDC* from 1980 until his death. From 1980 until 1987 he also served as Chief of the Decimal Classification Division at the Library of Congress. His term as Editor was characterized by an intense concern for user convenience and understanding. That concern was reflected in the most recent edition of the Classification (*DDC* 20), in the more than forty-five workshops he conducted, and in his work on the *Manual on the Use of the Dewey Decimal Classification: Edition 19*, which he co-authored with Margaret Warren and the Assistant Editors.

Prior to his appointment as Editor, he taught at the library schools of the University of California at Los Angeles, Western Michigan, and the University of Oregon.

He was the author of several books and numerous journal articles on the *DDC*. His books included *The Eighteen Editions of the Dewey Decimal Classification* (1976); *Exercises in the 20th Edition of the Dewey Decimal Classification* (with M. P. Satija, 1990); and *Dewey Decimal Classification, 20th Edition: A Study Manual* (with Jeanne Osborn, 1991).

Comaromi received his doctorate in library science from the School of Information and Library Studies at the University of Michigan in 1969. He was honored as a distinguished alumnus of the school in 1990.

Memorial contributions may be made to the John P. Comaromi Scholarship Fund, School of Information and Library Studies, University of Michigan, 550 E. University, Ann Arbor, MI 48109.—*Forest Press OCLC Inc.*

IN MEMORIAM:
JOHN P. COMAROMI
1937–1991

As the accompanying obituary makes clear, John Comaromi made very significant contributions to the library profession and its literature. The most notable, of course, was his work as editor of the 20th edition of the *Dewey Decimal Classification*. With that work he joined the illustrious company, stretching back to Melvil Dewey himself, of those who have created and developed the most widely used library classification system in the world. In addition to his service as editor, he has been involved with the Dewey classification in two other roles. Prior to his appointment as editor, he served as member and chair of the Decimal ClassificationEditorial Policy Committee. He has also served as the historian of the classification, beginning with his doctoral dissertation delineating the history of its first 15 editions. His intimate familiarity with past editions often illuminated the deliberations of the Editorial Policy Committee.

John Comaromi never viewed the creation and application of the classification as a purely intellectual exercise. It was, for him, first and foremost a working tool for the working librarian. He strove always to reach out to the library community. He did this in three ways. He conducted a detailed survey of the use of the classification in the United States and Canada. Based on needs disclosed in that survey, he initiated the work on the *Manual on the Use of the Dewey Decimal Classification: Edition 19*. That work was so well received and so widely used that a revised version was incorporated into the 20th edition of the classification. It is safe to say that all future editions will include such a manual. Finally, he reached out to the library community in a more immediate and personal way by organizing and conducting an extensive, nationwide series of workshops on the 19th edition of the classification. John's teaching skill here met a strongly felt need of a multitude of librarians. The great success of these workshops led to the preparation of similar workshops following the publication of the 20th edition.

John Comaromi has made a lasting contribution to a classification that is already a century old, and that gives promise of growing and thriving well into the third millennium. His work will live long.

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The History of Linking Devices

Barbara B. Tillett

"Linking devices" are those specific devices within the catalog that connect or link bibliographic records for related items. A review of principal sets of cataloging rules from Panizzi to the present revealed an interesting evolution in the various linking devices used in library catalogs over the years. The devices in the catalog for relating bibliographic items have evolved along with the type of catalog available. Linking devices used for bibliographic relationships were designed to take advantage of the book and card formats of the catalogs. Without thought of improvements that might be made in the computer environment, many of the old devices for expressing relationships were embodied in online catalogs. We have begun to explore new linking devices that will take best advantage of the computerized formats of future catalogs.

In the first two articles in this series, a taxonomy of bibliographic relationships was reported and an overview of the treatment of the various relationships in cataloging rules was presented. A review of principal sets of cataloging rules from Panizzi to the *Anglo-American Cataloguing Rules*, second edition (*AACR2*)[1] revealed an interesting evolution in the various linking devices used in library catalogs over the years. "Linking devices" are those specific devices within the catalog that connect or link bibliographic records for related items. We now turn to an examination of each device, indicating its specific use as a linking mechanism.

Linking devices encompass the following:

1. Catalog entries
    - Multiple entries
    - Common main-entry headings
    - Dash entries
    - Analytical entries
    - Cross-references
    - See also references
    - See references
    - Added entries
    - Name, title, and series added entries
    - Multilevel description
2. Uniform titles
3. Other linking devices
    - Notes, including contents, annotations of a library's holdings, etc.
    - References to multiple entries or headings
    - Edition statements
    - *Series statements*
    - Additions to the physical description

Often a device used to show relationships is also used for other purposes. For example, an added entry heading is used to link two bibliographic records, but it may also act simply as an access point for one bibliographic record. In the first

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Barbara B. Tillett is Head of the Catalog Department, University of California, San Diego. Invited paper received and accepted for publication September 20, 1991. *Editor's Note:* Library Resources & Technical Services *is pleased to present the third in a series of research reports on the topic of bibliographic relationships. These reports are derived from the author's 1987 Ph.D. dissertation, "Bibliographic Relationships: Toward a Conceptual Structure of Bibliographic Relationships Used in Cataloging."*

situation, it expresses a bibliographic relationship, while in the second it merely identifies an access point. In this article discussion is limited to the devices used as links for bibliographic relationships.

CATALOG ENTRIES[2]

Various types of catalog entries have been used as linking devices: multiple entries, cross-references, added entries, and entries based on multilevel description. It is probably not surprising that changes in such entries directly correspond to changes in the physical form of library catalogs. Just as catalogs emerged from inventory lists on clay tablets and progressed through handwritten card catalogs, typeset book catalogs, and printed or typed card catalogs to arrive at computerized, computer-output microform (COM) and online catalogs, so catalog entries have evolved from single, brief entries on a chronological list and progressed through single-author entries and cross-references in book catalogs, and more complex added entries in card catalogs, to arrive at the present records in machine-readable form based on the MARC format.

Panizzi's rules, published in 1841, suited the then-predominant book and handwritten card catalogs. As a result of the economic restrictions on the size of book catalogs and the extensive time involved in writing cards for the handwritten card catalogs, Panizzi's rules called for a bibliographic item to be described in full only once, by means of an "entry." To provide more complete access to the entries and to make the catalog more than a mere finding list or inventory of the collection, the rules called for "cross-references." Panizzi's three classes of cross-references linked (1) name to name, (2) name to work, (3) work to work.

The first class of cross-references referred the catalog user from a variant form of name to the form chosen for an "entry heading." The second class of cross-references directed the user to a catalog entry for a work from headings that might be considered equally as important as the main heading in accessing the entry. Such headings included personal, corporate, conference, and geographic names, as well as the names of works, i.e., titles. The third class served to direct the user from one work to another work, most commonly from parts of a work to the whole work in which they were contained.

Entries and cross-references continued to be the basic elements of the catalog through the turn of the century, even after the card catalog became predominant. The use of handwritten cards and the effort to economize on the number of entries perpetuated single full entries and brief additional entries.[3] However, there were instances in early catalog codes prescribing multiple entries as described below.

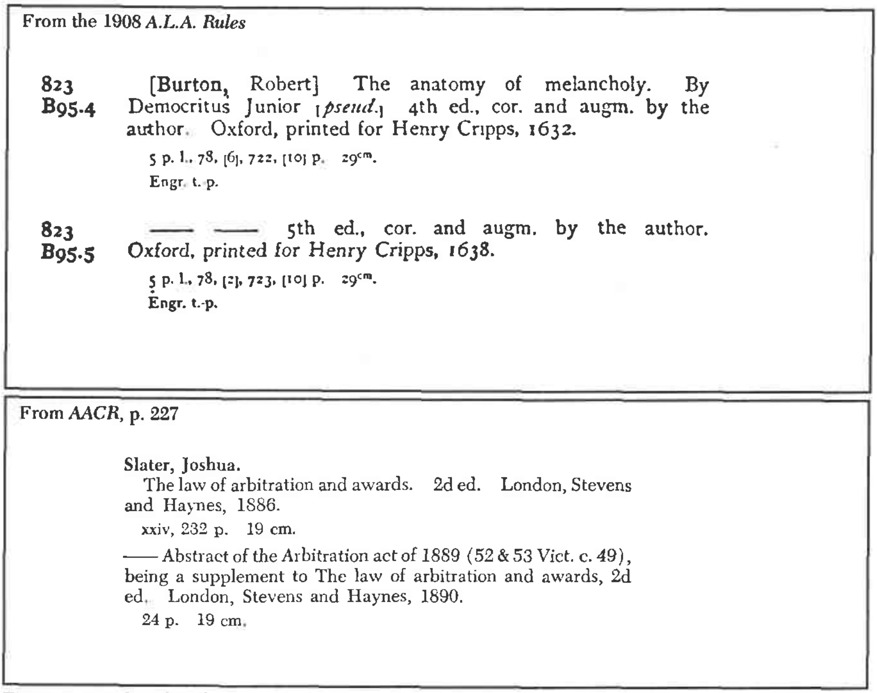
COMMON MAIN ENTRY HEADINGS

One method for linking separate bibliographic records is the use of a common main entry heading in order for two or more related bibliographic records to display together in a catalog. This is particularly useful for showing descriptive relationships, derivative relationships, whole-part relationships (especially when uniform titles are involved), and accompanying relationships.[4] But there are other entries within entries that express bibliographic relationships. These entries within entries are dash entries and entries based on multilevel description.

DASH ENTRIES

A dash entry, variously called dash-on, dashed, or dashed-on entry, is an entry subordinate to another entry under which it is made. Such entries were found in early catalogs, including the British Museum catalog, but the first evidence of dash entries in the rules examined was in the miscellaneous rules of the 1883 "Condensed Rules." The unnumbered 1883 rule called for a single dash or indent to indicate the omission of the preceding heading and the use of two dashes or indents to indicate the omission of a heading followed by a subheading or title. A dash entry is shown in figure 1. This same information was given in rule 75 of the 1902 *A.L.A. Rules-Advance Edition*.

By 1908 the dash entry was prescribed



From the 1908 *A.L.A. Rules*

823 [Burton, Robert] The anatomy of melancholy. By
B95.4 Democritus Junior [*pseud.*] 4th ed., cor. and augm. by the author. Oxford, printed for Henry Cripps, 1632.
5 p. l., 78, [6], 722, [10] p. 29^{cm}.
Engr. t. p.

823 —— —— 5th ed., cor. and augm. by the author.
B95.5 Oxford, printed for Henry Cripps, 1638.
5 p. l., 78, [2], 723, [10] p. 29^{cm}.
Engr. t.-p.

From *AACR*, p. 227

Slater, Joshua.
The law of arbitration and awards. 2d ed. London, Stevens and Haynes, 1886.
xxiv, 232 p. 19 cm.
—— Abstract of the Arbitration act of 1889 (52 & 53 Vict. c. 49), being a supplement to The law of arbitration and awards, 2d ed. London, Stevens and Haynes, 1890.
24 p. 19 cm.

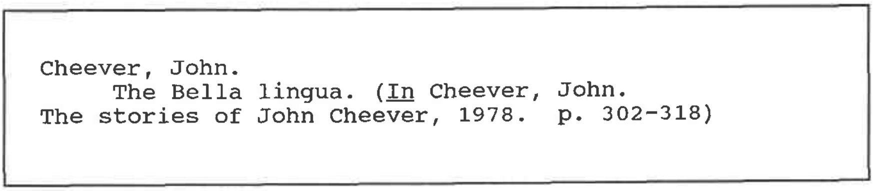
Figure 1. Samples of Dash Entry.

for indexes and atlases. Pierson's rules for periodicals (1931) used the dash entry for indexes and supplements. In the 1941 *A.L.A. Catalog Rules*, the use of dashes continued for atlases, indexes, and supplements, as well as for separate continuations, detached copies; and photostat copies. In the A.L.A. rules of 1949, the dash entry was used for both continuations and supplements dependent on the work they continued. The LC Rules of 1949 had six rules using dash entries for copies; for offprints; for accompanying materials, e.g., supplements, atlases, or portfolios whose main entries differed from those of accompanied works; for detached copies, as well as for supplements dependent on the main work for title and for supplements to serials that are themselves serials. The last appearance of dash entries was in 1967 in the *Anglo-American Cataloging Rules* (*AACR*), where various rules prescribed a dash entry for copies, detached copies, issues, offprints, microreproductions and photocopies, photoreproductions other than facsimile editions, supplements, and indexes.[5] The dash entry was a convenient method of economizing on the number of cards needed in the catalog for items sharing the same basic bibliographic description or sharing the same author and title information. In 1978 *AACR2* abolished the dash entry by prescribing separate entry for items that would have been given a dash entry under earlier rules, or by allowing multilevel description. This abandonment of the dash entry reflects the shift from the card-based catalog to a catalog built on MARC-formatted records.

ANALYTICAL ENTRIES

Another type of entry used as a linking device is the analytical entry, which is an entry for a part of some whole work. The *ALA Glossary of Library and Information Science* defines analytical entry as "a bibliographic record of a part of a bibliographic item for which a comprehensive record may be made."[6]

Analytical entries evolved from analytical references. Panizzi's rules for his third



Cheever, John.
The Bella lingua. (In Cheever, John.
The stories of John Cheever, 1978. p. 302-318)

Figure 2. Example of an Analytical Reference.

class of cross-references were almost exclusively for analytical references from a part of a work to the whole work, but the term *analysis* did not appear in the rules until 1867, when the Library of Congress rules mentioned cases to be "analysed" [sic] in rule 22. By 1876, Cutter's rules included an entire section called "Analysis," and "analytical references" were included in his definitions. Cutter's analytical reference was in fact a separate brief entry with a note referring the catalog user to the bibliographic record for the larger work (see figure 2 for an example of an analytical reference in the style of Cutter).

Today there are several techniques available in *AACR2*'s Chapter 13 for analysis, ranging from separate analytical entries (see figure 3) to multilevel description, but analytical "references" are no longer included as an option. The use of the added entry for analytical entry is described in the section below on added entries.

SEE REFERENCES

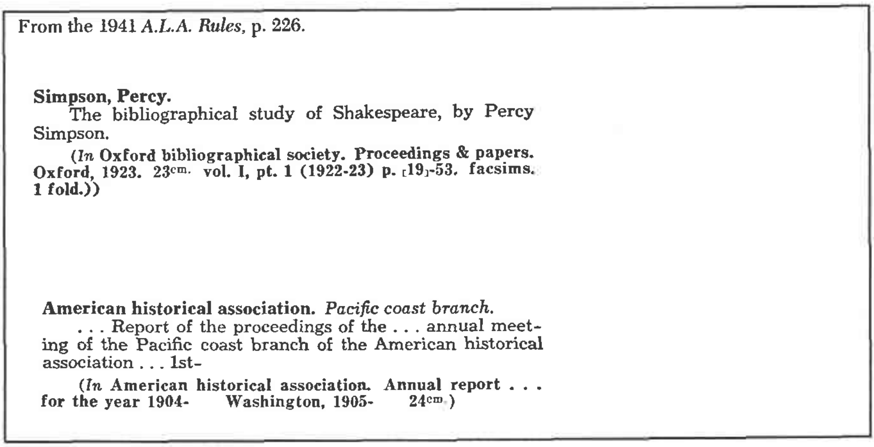
Cross-references have been a primary linking device at least since the 1841 cataloging rules of Panizzi. Two categories of cross-references have evolved: *see references* and *see also references*. The most common type of reference is the see reference, which refers the user from a heading not used as an entry heading to one that is used, such as:

Clemens, Samuel Langhorne, 1835–1910
see
Twain, Mark, 1835–1910.

Cutter often expanded the wording of his see references to provide connections between works. For example, his rules prescribed the following phrases to connect periodicals that changed names:

"For a continuation, see" or
"For the previous volumes, see . . ."[7]

These phrases might appear either as a referential note on an entry or as a separate cross-reference entry.



From the 1941 *A.L.A. Rules*, p. 226.

Simpson, Percy.
The bibliographical study of Shakespeare, by Percy Simpson.
(*In* Oxford bibliographical society. Proceedings & papers. Oxford, 1923. 23cm. vol. I, pt. 1 (1922-23) p. [19]-53. facsims. 1 fold.))

American historical association. *Pacific coast branch.*
. . . Report of the proceedings of the . . . annual meeting of the Pacific coast branch of the American historical association . . . 1st-
(*In* American historical association. Annual report . . . for the year 1904- Washington, 1905- 24cm.)

Figure 3. Examples of Analytical Entries.

SEE ALSO REFERENCES

See also references link one valid heading to another in the manner shown here:

> United States. Air Force. Air Research and Development Command
> see also
> United States. Air Force. Office of Aerospace Research.

All of Panizzi's cross-references were see references, while see also references initially were introduced in Cutter's rules to link subject terms. In the first edition of Cutter's rules (1876), in the section on style, under "references,"[8] we find two types of references presented: "see" when there is no entry under the first term and "see also" when there is one. While in this first edition Cutter uses the see also reference between two subject headings, in the fourth edition he uses it between names to show spelling variations of surnames. By the 1908 *Catalog Rules*, see also references were extended: for works by an individual who also wrote as head of a department, we are asked to make a reference to see also the name of the department, and for a pope to see also under his official name. However, the fate of see and see also references soon took a different turn.

ADDED ENTRIES

In 1901 a monumental occurrence changed the structure of catalogs. In January of that year the Library of Congress began selling its printed catalog cards to libraries. In the introduction to the 1902 *A.L.A. Rules—Advance Edition*, the spirit of cooperative cataloging and the introduction of greater uniformity through the use of LC's printed cards were cited as reasons for reviewing the cataloging rules and producing an "advance edition." With the printed card catalog came a new concept, that of an added entry. With printed cards additional entries could economically be produced using the basic main entry card, later to be known as the unit card, with a secondary heading typed at the top. Thus rather than using a brief cross-reference to provide additional access, catalogers made a full added entry. The added entry is similar in concept to dual entry, in that full bibliographic information for the same item is displayed under two separate headings in the catalog, with the difference being that the making of added entries could be done at considerable savings of time and effort. Dual entries were a device in use prior to printed cards.

The *A.L.A. Advance Edition* rules of 1902 were the first of the rules examined to mention added entries. However, no definition of "added entry" was provided until Cutter's rules in their fourth edition in 1904. In fact it appears that the early rules had not distinguished when to use an added entry and when to use a cross-reference. Before added entries were introduced, references both provided secondary access to bibliographic records and linked headings for related names or works. As for which of the two to use, an added entry or a reference, when providing access to a bibliographic record, there were nearly as many rules in the codes from 1902 through 1949 requiring cross-references as there were for added entries. When to use references, and when added entries, continues to be ambiguous even in the current rules.

It was in the preface to the fourth edition of his rules, published in 1904, that Cutter acknowledged the advent of printed cards and provided the first definition for "added entry."

> *Added entry*, a secondary entry, i.e., any other than a main entry.[9]

Cutter also added an annotation to his definition of *reference*:

> In a printed-card catalog added entries often take the place of references, because one thereby gives more information with less work.[10]

In other words, card catalogs based on a printed unit card system could include the full bibliographic description of an item under each heading for the item. Cards with typed headings at the top could then be filed in the appropriate alphabetical position in the catalog. In Cutter's rules, entries were full registries of books in the catalog, whereas references, lacking imprints, were partial registries. The term *cross-reference* was used exclusively, at least in the first through third editions of his rules, to describe a reference from one subject to another. However, again Cutter did not make clear precisely when added entries were to take the place of references or even whether references were still appropriate at all in a printed card catalog; nevertheless, his examples showed that he continued to prescribe the use of references, particularly those references for name variations. All the same, the use of references or added entries to access a bibliographic record remained an unspecified "either-or" in Cutter's rules as in the 1902 *A.L.A. Advance Edition* rules.

To add to the lack of clarity, in the 1902 catalog code there were rules calling for a "reference *or* an added entry." Such rules persist even through our current *AACR2.*[11] In the 1908 code there were fourteen rules requiring a choice between cross-reference or added entry; with two exceptions, for links to other items, all were for providing headings as access to bibliographic records. It may be that libraries preferring to use *cross-references,* in the cases described by these rules, were those without printed card catalogs, that is, libraries that could not easily create an added entry or found it uneconomical to do so.

One of the economies cited by Cutter in his fourth edition (rule 114) of 1904 promotes further confusion by describing an added entry but calling it a reference:

> In printed-card catalogs a reference for a particular book is made by inserting the whole card with suitable heading and with underlining of such parts of the title or notes as will show why the reference is made.[12]

It would appear, thus, that the term *reference* was used to indicate both the referential instruction, e.g., "A see also B," as well as the record containing that instruction, i.e., the cross-reference entry in the catalog. From Panizzi's rules through Cutter's third edition, the only device for additional access to bibliographic entries was the cross-reference. But once added entries were introduced, the rules from 1902 onward provided for a wide variety of additional entries under headings once managed by cross-references. This naturally contributed to the confusion over which device to prefer in a given situation, the cross-reference or the added entry.

However, as time progressed, indications of when to use added entries and when to use cross-references became clearer; added entries were consistently used for added access to a bibliographic record, and cross-references, called simply references, were used for name variations.

There were still many rules in each of the catalog codes through *AACR2* (1978) that called for using a cross-reference in place of multiple added entry records or an added entry in place of multiple cross-reference records. The general rationale was that added entries replaced cross-references, or vice versa, when such a replacement resulted in a reduction of catalog cards. This rationale was suggested at least as early as August 6, 1901, on a supplementary rule on cards later printed as rule 19 of the LC *Supplementary Rules* (1905):

> When there are several editions of the same work in the Library, only one is as a rule to be represented under subject, translator, editor, or added title entry. As far as practicable this edition is to be the most useful (earliest or latest) or the most valuable (best edited, first, or rarest) as the case may be.
>
> Translations, one from each language (as far as practicable the best or most useful when there are several) are also to be entered under the *subject.* The author card for that edition or translation which is to be represented under the added entries is to be distinguished as follows:
>
> To the left of the added entries (on the face or back of the card, as the case may be) write: "Stamp for other editions."
>
> On the author cards for other editions write, in the place indicated above, the word "Stamped."
>
> When the cards have been thus marked and a new edition necessitates further added entries (new editor, additional subjects, etc.) special care must be taken to indicate clearly on the author card that the new entries are to be written by the copyists and are not to be omitted from the catalog. For this purpose *new added entries* are to be distinguished by the word "Write."[13]

The added entry, introduced with the advent of printed catalog cards in 1901, was a device to provide supplementary access to bibliographic records from names, titles, and subjects closely associated with the bibliographic items being described. The cross-reference slowly evolved from a device directing the user from secondary headings for a record to the main entry heading for the record into a device to link variant name headings. The device directed the user from unused forms of names used as headings to preferred forms of names. (Here names are used in the generic sense as names of persons, corporate bodies, bibliographic items, topical subjects, etc.)

MULTILEVEL DESCRIPTION

Another type of catalog entry used as a linking device is an entry based on multilevel description. Multilevel descriptions are used for whole-part relationships and accompanying relationships. *AACR2* rule 13.6 covers multilevel descriptions to describe a whole work and its individual parts, including some accompanying materials. This practice generally has not been used in the United States other than for some archival and manuscript collections, but is a useful device for expressing whole-part and accompanying relationships. We may see an increased use of this device with more collection level records entering our national databases.

UNIFORM TITLES

Another major type of linking device is the uniform title. Uniform titles have numerous functions in the catalog. Many of these functions are to link bibliographic records that represent related bibliographic items.

The use of a standardized form of heading for titles of works appears in all the catalog codes examined. Such standardized forms of titles changed from mere assembling devices, designed to collocate versions and selections of the Bible and other sacred scriptures, to "form headings" designed to assemble materials of a particular type (legal materials, encyclopedias, liturgical works, etc.), and uniform titles of physical works designed to assemble the component parts of a work, and finally to uniform titles designed to uniquely distinguish works from other works with similar titles. Over time the terminology for uniform titles has varied. The term "uniform title" is used in this article to refer to all such standardized titles. The glossary definition in *AACR2* for uniform title is,

> 1. The particular title by which a work that has appeared under varying titles is to be identified for cataloging purposes. 2. A conventional collective title used to collocate publications of an author, composer, or corporate body containing several works or extracts, etc., from several works, e.g., complete works, several works in a particular literary or musical form.[14]

By the 1967 *AACR* rules, influenced by Lubetzky and the Paris Principles, an entire chapter (4) was devoted to uniform titles and there were over 75 rules calling for uniform titles or form headings. *AACR* continued the practices of earlier rules and expanded them to include all cases where editions, translations, etc. have appeared under various titles and for cases where the wording on the title page obscured the title.[15] To examine several of the specific rules in *AACR*, most of which continue in *AACR2*, we provide the following review.

AACR added a qualifying word or phrase to a uniform title to distinguish it from other similar titles. For example, uniform titles for translations added the name of the language after the standardized title of the original work (*AACR* rule 105). For collections of parts of works the larger work's title was amended with the subheading "Selections" (*AACR* rule 106). For collected editions rather than specific titles, the rule called for using as a uniform title the term, "Works," "Selected works," or "Selections" (*AACR* rule 107). An extensive scheme for music uniform titles was presented in *AACR*, with the uniform title often representing the type of music being described in preference to the individual title of the piece of music; the reason for this treatment given in *AACR* was that music is often issued in numerous editions with a wide variety of wording on the title pages and often in multiple languages.[16] At times the rules recommended using the title of the first edition as the uniform title, and in other instances a conventional or standardized brief title. The choice of which to prefer depended on the use to be made of the uniform title and the presence or absence of a first edition. Presently, in *AACR2* and in the *LC Rule Interpretations*,[17] uniform titles are used as follows: (1) a device to collocate materials by their general form, (2) a device to differentiate among identical or similar titles, and (3) a device to link manifestations of a work.

The rules have often mixed and confused these distinctions. Let us examine these three distinctions each in turn.

UNIFORM TITLES AS DEVICES TO COLLOCATE MATERIALS BY THEIR GENERAL FORM

The *ALA Glossary of Library and Information Science* defines "form heading" as

> an access point to a bibliographic record, consisting of a word or phrase which designates the type of composition (literary, artistic, musical, etc.) of the work(s) contained in the bibliographic item (e.g., Short stories, Portraits), or the general format of the item (e.g., Atlases, Encyclopedias and dictionaries).[18]

Panizzi used form headings, including, for example, "Academies," "Periodical Publications," "Ephemerides," "Catalogues," "Dictionaries," "Encyclopaedias," and "Liturgies." Cutter limited the number of form headings to "Encyclopaedias," "Indexes," and "Periodicals." He also recognized a form subheading: "Collections," which was added to the heading for any form of literature.

The addition of a form subheading to standardize a heading also appeared in the LC *Supplementary Rules* on "Treaties"[19] specifying "Treaties, etc." as a subheading under the first party named on the title page of a treaty. In the LC *Rules on Cards*, the 1905 rule on "Charters" specified the use of the word, "Charters," as a subheading under the heading for a political jurisdiction, further specifying added entries for the jurisdiction with the subheading "Laws, statutes, etc." This practice was also identified on the LC *Rules on Cards* for *Laws, Constitutions, Charters,* dated 1922, which added to the jurisdiction the subdivision for "Constitution." The subdivision "Liturgy and ritual" under a church or denomination was called for on the LC *Rules on Cards* for *Liturgies* dated 1916; the rule which further specified the use of the name of a service book as an additional subheading. By 1941 the A.L.A *Rules* had greatly extended the use of form subheadings, listing subheadings for Laws, statutes, etc.; Ordinances, etc.; Constitution; Charters; Treaties, etc.; Liturgy and ritual; Canon law; Canons, decretals, etc., and Legend. It also gave further subheadings to be used under uniform titles for the Bible to indicate: For the blind; Harmonies; Lessons, Liturgical; Manuscripts; Paraphrases; Selections; and Shorthand.

In the Paris Principles of 1961, conventional titles indicating the nature of the material were recommended for subheadings under jurisdictions for constitutions, laws, and treaties (principle 9.5). For multi-lateral and international treaties and conventions and other publications with non-distinctive titles, the principles suggested entry under uniform conventional headings chosen to reflect the form of the work (principle 11.6).

With the 1978 *AACR2*, some of the form subheadings used in earlier rules changed, e.g., "Laws, etc." is used in place of "Laws, statutes, etc." and other legal subheadings.[20] Much greater detail was provided in *AACR2* rules for uniform titles and various subheadings for sacred scriptures and for music. Other form headings, such as Academies, Dictionaries, etc. found in the early rules, were abandoned by the time of *AACR*.

We might in the future find it more useful to delineate among the various access devices now all called uniform titles. For example, form headings and subheadings are really in a class by themselves. They serve to collocate similar types of materials in ways more akin to subject access (as a shared characteristic relationship).

UNIFORM TITLES AS DEVICES TO DIFFERENTIATE AMONG IDENTICAL TITLES

Chapter 25 of *AACR2*, rule 25.5B specifies providing "in parentheses an appropriate explanatory word, brief phrase, or other designation to distinguish a uniform title used as a heading from an identical or similar . . . uniform title used as a heading or reference." This rule has been extensively revised for serials, including numbered series, in an LC rule interpretation[21] to prescribe particular qualifying terms and a priority order for their use. This rule interpretation requires a title be qualified whenever it conflicts with another title. The rationale given is that the uniform title thus created becomes the main entry heading to be used for referring to the title from linking notes in other bibliographic records. This type of uniform title has the opposite goal of other uniform titles, in that it separates and uniquely identifies titles of works rather than brings them together.

UNIFORM TITLES AS DEVICES TO LINK MANIFESTATIONS OF A WORK

Uniform title may also serve to bring together the various manifestations of a work by providing a consistent (uniform) entry heading to collocate the records for those manifestations in the catalog. Names for such titles include factitious entries, standardized titles, conventional titles, filing titles, uniform headings, etc. Often such titles serve also to collocate parts of works.

Some "abstract works" specified in the cataloging rules have been: sacred scriptures; folklore that was originally from an oral tradition, such as epics, cycles, national folktales; some songs; and manufactured "wholes," such as sets of documents from a particular legal case.

The 1941 A.L.A. *Rules* (rule 92) told the cataloger to create a "factitious entry" to collocate all briefs and other legal documents related to a law case under a uniform title for the case. This provides a link between the whole and its parts.

Both Panizzi and Cutter were early advocates of the use of *standardized titles* for various editions of sacred works and epics. Panizzi used the standardized or uniform title, "Bible" to collocate all parts of the Bible or whole works. Expanding the practice to other sacred scriptures began with the first edition of Cutter's rules. This practice continues through *AACR2*. Cutter also extended the standardized title to popular anonymous epics. The 1908 *Catalog Rules* extended Cutter's use of well-known titles for epics to include national folk tales and the like, preferring to use the English names by which the epics were known or the vernacular names if better known. Rule 204b of the 1941 *A.L.A. Rules* assembled all parts of a cycle in one place using added entries for the cycle followed by the language of the text.

The glossary in the 1941 rules gave a definition of "uniform title":

> The distinctive title by which a work which has appeared under varying titles and in various versions is most generally known. *See also* rules for anonymous classics.[22]

A synonym listed in the glossary was "Conventional title," and the rules were not consistent in using the term "uniform title," except for rules for music. In other areas the term "conventional title," "distinctive title," "title generally known," or "uniform heading" was used. Uniform titles were prescribed for inscriptions, sacred scriptures and their parts, manuscripts, anonymous classics, incunabula, and music. The *A.L.A. Rules* of 1949 called for "conventional title" entry for anonymous classics and translations of them with various additions when needed to distinguish between headings. Conventional or standard titles were used for music. Most of the 1941 rules for form headings and uniform titles persisted in the 1949 rules. The LC rules of 1949 focused on music conventional titles and its glossary defined "conventional title" as

> A filing title constructed according to fixed rules to present in a systematic order the catalog entries for the various forms of a musical work.[23]

The definition of "filing title" was

> The title by which a work that has

> appeared under varying titles is filed. (*See also* Conventional title.) The phrase "filing title" is also used at the Library of Congress to refer to such filing media as "Works," "Selections," "Correspondence," etc., which are used so that such works will be arranged systematically in the catalog.[24]

The Paris Principles of 1961 specified a "uniform title" for virtually every work entered under title, either as the main entry heading or as an added entry, stating under principle 6.1,

> The main entry for works entered under the title may be *either* under the title as printed in the work, with an added entry under a uniform title, *or* under a uniform title, with added entries or references under the other titles. The latter practice is recommended for the cataloging of well-known works, especially those known by conventional titles . . .[25]

More detail was provided in principle 11.3 and 11.4 as to which title to prefer for the uniform title. These principles made the distinction between works in various editions and works in successive parts. An extensive analysis of actual, uniform title practice reflected in various cataloging codes was provided by Eva Verona in her commentary on the Paris Principles. She noted the possibility for three methods of providing a uniform title:

1. provide an added entry for the uniform title,
2. provide main entry for the uniform title with an added entry for the title proper, and a split method,
3. provide main entries under uniform title only for editions of well-known works and added entries for uniform titles for other publications.

She noted wide disagreement on this point among attendants of the Paris Conference.[26] With online records and display capabilities evolving, these rules should be reexamined.

Both *AACR* (1967 rule 106) and *AACR2* (1978 rule 25.6) call for uniform titles for parts of works. For single parts they suggest an explanatory reference (especially, *AACR2* rule 26.4A2), as well as the uniform title added to the main entry heading to link the part and the whole. When cataloging several parts, the rules recommend including the numeration as part of the uniform title for the part and making name-title added entries for the other parts. Besides the uniform title added to the main entry heading, other devices to collocate the component parts of a work under the heading for the whole have been title or series added entry and, since 1941, the analytical added entry.[27]

In assembling title variations of serials, various rules have suggested using one of the titles as the uniform heading for all title variations. Jewett's rules and all of the ALA rules suggested using the latest title, while Cutter suggested the earliest. Paris Principle 11.5 recommended as uniform title for a serial with slight title variations, the most frequent title. *AACR* and *AACR2* preferred successive entry, that is entering each title separately, while linking the bibliographic entries through a note. Online systems of the future may provide still other means for collocating serial records for displays.

At least since 1916, the Library of Congress had a practice of pencilling on their cards a filing title for a transliterated title and a filing title for the original title of a translated work.[28] In 1941, filing titles were printed on the cards and the LC practice of pencilling filing titles on the card's upper right-hand margin was abandoned.[29]

In *AACR2*, chapter 25, uniform titles are suggested when a work appears in more than one manifestation with different titles, so long as the title proper differs from a uniform title, or when filing purposes mandate an added element as a useful addition. Rule 25.3C1 for works published simultaneously in the same language under two titles presents problems for sharing records, because the uniform title it specifies varies according to chance circumstances. It tells the cataloger to use as a uniform title the title of the edition published in the home country of the cataloging agency. If the item is not published in the home country, the title of the first edition that happens to be received by the cataloging agency is to be used. This is a practical solution, but leads to inconsistencies for shared records.

FUTURE UNIFORM HEADINGS: CITATION HEADINGS

From this review we can see that it is useful to link works that are of a particular literary form, to differentiate works with similar titles, to assemble the component parts of a whole, and to link manifestations of a work. In the past, in card and book catalogs it was useful to provide a uniform title in conjunction with the main entry heading in order to fulfill the one of the objectives of the catalog: to collocate the various manifestations of a particular work. The same objective could be met by setting up an added entry for the title.

Another objective of uniquely identifying works could be met by giving each work a citation heading composed of specified data elements such as author, title, date of publication, language, etc., or elements of the usual bibliographic description. Given then a bibliographic item that is related to a work, we would include in the record for the bibliographic item a citation to the work in a note. The citation would act as the linking device between the bibliographic item and the work. The citation is a necessary concept in identifying the object of a bibliographic relationship for a catalog user. The means for displaying citations and linking the related bibliographic records is left to system designers, but it is hoped the technique they design would eliminate the redundant use of tracings for information already provided in the text of the bibliographic description.

Another component of identifying the object of a bibliographic relationship is also to indicate the type of relationship. The possibility of various non-relationship uses for uniform titles, such as providing unique titles for serials to separate rather than collocate, has obscured its use as an alerting device for any bibliographic relationship portrayed. In fact, because uniform titles are not in themselves indicators of specific relationships, they would be more effective as specific linking devices, if distinctions were made among them to clarify their purpose to the catalog user.

OTHER DEVICES INCORPORATING LINKING INFORMATION

In this subsection we identify the remaining devices that have been used to convey linking information: notes, including annotations of a library's holdings, references to multiple entries or headings, edition statements, series statements, and additions to the physical description. Notes incorporate linking information for every type of bibliographic relationship. References to multiple entries or headings include explanatory references, to clarify the filing or catalog entry practices used in a particular catalog, and listings of related works. Edition statements incorporate information about derivative relationships. Series statements incorporate information about whole-part and sequential relationships. Finally, additions to physical description are used for accompanying materials.

NOTES

Throughout the cataloging rules notes appeared on bibliographic entries to provide further information about the bibliographic descriptions and bibliographic history of the items described. Notes pertaining to bibliographic relationships gave information about title variations, series, full or partial contents, specific library holdings, or related works. Sometimes information in a note was the only link to a related work, but occasionally references and, after 1901, added entries were used to provide an entry collocated with other entries for the related work.

Contents notes were used to list important works contained in a bibliographic item; either analytical entries or analytical added entries were made for those works. With the 1908 rules, the contents of a series were similarly handled. The bibliographic record for an item in a series included a series note, and a series added entry was made instead of making a contents note for the series. Analytical added entries and series added entries were devices used to display the component parts of a whole under a uniform heading.

REFERENCES TO MULTIPLE ENTRIES OR HEADINGS

General and informational references, available since Panizzi's rules, have provided instructions to the catalog user about filing peculiarities, entry practices, and other local information to assist the catalog user in locating desired material. Such references were usually prepared for public catalogs and recorded in authority files. Like other rules in the 1941 code, rules for references proliferated. Instructions for general references, explanatory references, and informational references appeared, and history cards to explain changes in names of corporate bodies became standard procedure. With the loading of LC Name Authorities in machine-readable form and a decision to no longer search pre-machine readable records, the Library of Congress dropped their use of the history card in 1984, and information about entities (persons, works, corporate bodies, conferences, etc.) was relegated to the authority control record and became more and more brief.[30]

EDITION STATEMENTS

Edition information has appeared on bibliographic records embedded in titles, provided in separate edition statements following the title, or when complex, given in notes. When multiple editions existed, the edition statement alerted the user to the other editions. That is, it provided the user with relationship information without explicitly identifying the related records. The related records did not have to be explicitly identified, because presumably they had the same main entry heading and title. Otherwise a note was provided about variant titles of other editions, often with an added entry made to collocate the entries for the variant titles or with a main entry under a uniform title.

SERIES STATEMENTS

The series statement began in the early rules as a series note. Through the 1902 rules, the series note was the only way to inform the user that the item in hand was part of a series. Later methods to provide a link to the series were through listing contents on a series card, as in the earlier rules, or through analyzing the individual parts of the series, as in the later rules. In the 1908 rule 128 an added entry for the series was prescribed. Specifically, the 1908 rule suggested the alternative of using a unit card for each individual part of a series with the title of the series at the top to file after the main entry card for the series.

ADDITIONS TO PHYSICAL DESCRIPTION

One of the principal linking devices to denote accompanying relationships is a brief description of the accompanying item as an addition to the physical description. This descriptive information is typically the only link to the related bibliographic item.

All of these linking devices have been effective to one degree or another in conveying bibliographic relationships. We documented the additional cards created for added entries and cross-references through tracings. We made explicit notes to link works or provided accompanying item information in the physical description. In other cases we implied the relationships by inserting a uniform title for the whole work into the bibliographic record for a variation or part of that work. We may find the online environment provides us with new opportunities to link records for related materials.

SUMMARY OF LINKING DEVICES

As we have seen, the devices in the catalog for relating bibliographic items have evolved along with the type of catalog available. During the time of book and handwritten card catalogs, dash entries, references, notes, edition statements, series statements, additions to the physical description, holdings annotations, common main entries, analytical entries, and uniform titles[31] were the linking devices used to relate items. The advent of the printed card catalog introduced added entries, including title and series added entries, multilevel description, and expanded use of analytical entries and uniform titles. These linking devices used for bibliographic relationships were designed to take advantage of the book and card formats of the catalogs. Without thought of improvements that might be made in the computer environment, many of the old devices for expressing relationships were embodied in online catalogs. And now we have begun to explore new linking devices that will take best advantage of the computerized formats of future catalogs.

As we develop new linking devices, let us keep in mind the main objective: to collocate or link records in displays for bibliographically related items and works, indicating the type of relationship either explicitly or implicitly. The pathways and clear road signs thus built will help guide users to those materials they seek.

REFERENCES AND NOTES

1. The list of the rules examined is given as an appendix to the second article in this series. See Barbara B. Tillett, "A Summary of the Treatment of Bibliographic Relationships in Cataloging Rules," *Library Resources & Technical Services* 35:149–165 (1991).
2. Portions of this article on entries and references also appeared as Barbara B. Tillett, "Bibliographic Structures: The Evolution of Catalog Entries, References, and Tracings," in *The Conceptual Foundation of Descriptive Cataloging*, ed. Elaine Svenonius, p.149–65 (San Diego, Calif.: Academic, 1989).
3. At the time of the first three editions of Cutter's rules, 1876 to 1891, catalogs were constructed of two types of "registries": (1) full registries with title and imprint, which were called entries, and (2) partial registries, called references, that omitted the imprint and referred to the full entry. Cutter preferred the term *reference* to *cross-reference*, with *cross-references* being exclusively used for subject references. The plain "reference" had several functions: (1) it served as a directional device for name variations, as in Panizzi's first class of cross-references; (2) it provided added access to works, as in Panizzi's second class; and (3) it linked works, as in Panizzi's third class.
4. The reader is referred to two preceding articles for more information on the categories of bibliographic relationships. See Tillett, "A Summary of the Treatment of Bibliographic Relationships in Cataloging Rules," noted above, and "A Taxonomy of Bibliographic Relationships," *Library Resources & Technical Services* 35:150–58 (1991).
5. The specific rules in *AACR* for copies and supplements are rule 152A for issues treated as copies; rule 152B for different issues as "Another issue"; rule 152C for photoreproductions other than facsimile editions—the dash entry includes significant data about the reproduction (whether it is a microfilm, photocopy, etc.); rule 153 for offprints when the larger work is in the library, adds the dash on "Offprint" to the analytical entry for the part; rule 154 for detached copies when the library has the larger work, adds the dash on "Detached copy" to the analytical entry for the part; rule 155A1 for supplements, indexes, etc., as dependent works, uses the dash for the author heading or title entry and then giving the description of the supplementary work described in detail; rule 155A2 uses two dashes when the title of the supplement includes the title of the main work; and finally, rule 168 for supplements to a serial that are themselves serials, uses the dash entry when the title is dependent.
6. *ALA Glossary of Library and Information Science*, ed. Heartsill Young (Chicago: American Library Assn., 1983), p.8.
7. See Charles Ammi Cutter, *Rules for a Printed Dictionary Catalogue* (Washington, D.C.: Govt. Print. Off., 1876), rule 54; *Rules for a Dictionary Catalogue*, 2d ed. (1889), rule 73; *Rules for a Dictionary Catalogue*, 3d ed. (Washington, D.C.: Govt. Print. Off., 1891), rule 73; and *Rules for a Dictionary Catalog*, 4th ed. rewritten (Washington, D.C.: Govt. Print. Off., 1904), rule 133.
8. See Charles Ammi Cutter, *Rules for a Printed Dictionary Catalogue* (1876), rule 159; *Rules for a Dictionary Catalogue*, 2d ed. (1889), rule 203; *Rules for a Dictionary Catalogue*, 3d ed. (1891), rule 203; and *Rules for a Dictionary Catalog*, 4th ed. (1904), rule 286.
9. Cutter, *Rules for a Dictionary Catalog*, 4th ed. (1904), p.13.
10. Cutter, *Rules for a Dictionary Catalog*, 4th ed. (1904), p.21

11. See *Anglo-American Cataloguing Rules*, 2d ed., ed. Michael Gorman and Paul W. Winkler (Chicago: American Library Assn., 1978) "reference or added entry" rules 26.5 and 21.29G.
12. Cutter, *Rules for a Dictionary Catalog*, 4th ed. (1904), p.55.
13. Library of Congress. *Supplementary Rules on Cataloging* (1905), rule 19.
14. *Anglo-American Cataloguing Rules*, 2d ed. (1978), p.572.
15. A note on p. 145 of *AACR* (1967) states: "The use of uniform titles in the case of the following types of works is widespread and of long standing.
    - Sacred scriptures
    - Creeds and confessions common to different religious bodies
    - Liturgical works
    - Anonymous works without titles
    - Early anonymous chronicles and literary works
    - Early collections entered under title
    - Early anonymous compilations of ancient laws and customs

    Uniform titles on Library of Congress printed cards will be largely confined to categories listed above, to editions of law and music, and to recordings of music."
16. *Anglo-American Cataloging Rules*, prepared by the American Library Association, the Library of Congress, the Library Association, and the Canadian Library Association. North American text, with supplement of editions and changes. (Chicago: American Library Assn., 1967), p.299 and rules 233–252 on uniform titles for music.

    The reader is also referred to the historical review of uniform titles in cataloging rules for music found in Richard P. Smiraglia, *Music Cataloging: The Bibliographic Control of Printed and Recorded Music in Libraries* (Englewood, Colo.: Libraries Unlimited, 1989).
17. The Library of Congress issues rule interpretations to *AACR2* to explain LC's decisions on how best to handle problematic rules and to clarify LC's internal cataloging policies.
18. *ALA Glossary of Library and Information Science*, p.100.
19. See Library of Congress, *Supplementary Rules on Cataloging* (1905) on "Treaties" (printed Jan. 8, 1904, augmenting *A.L.A. Rules—Advance Edition* (1904), rule 13).
20. *AACR2* claims not to use form headings, calling such headings uniform titles. However, some headings for laws and music are, in fact, form headings.
21. *Cataloging Service Bulletin* 25:70–74 (Summer 1984).
22. *A.L.A. Catalog Rules, Author and Title Entries*, prepared by the Catalog Code Revision Committee of the American Library Association, with the collaboration of a Committee of the (British) Library Association. Preliminary American 2d ed. (Chicago: American Library Assn., 1941), p.xxxi.
23. *Rules for Descriptive Cataloging in the Library of Congress* (Washington, D.C.: Library of Congress, Descriptive Cataloging Division, 1949), p.109.
24. Ibid.
25. International Conference on Cataloguing Principles, *Statement of Principles Adopted at the International Conference on Cataloging Principles*, annotated ed., with commentary and examples by Eva Verona, assisted by Franz Georg Kaltwasser, P. R. Lewis, and Roger Pierrot (London: IFLA Committee on Cataloguing, 1971), especially p.20.
26. Ibid., especially p.107.
27. Analytical added entry was first prescribed in the 1941 A.L.A. rule 223c and remains through *AACR2* rule 13.4.
28. See *Library of Congress Rules on Cards* for "Translations—Note of Original Title," dated Aug. 7, 1916.
29. Ibid.
30. The practice at the Library of Congress for name and series authority records, including the limits on scope and history information, is recorded in its *Cataloging Service Bulletin* 24:25–55 (Spring 1984).
31. Since 1987 when this study of linking devices was documented in my dissertation, additional publications have appeared further exploring this topic. In particular the reader is referred to Sherry L. Vellucci, "Uniform Titles as Linking Devices," *Cataloging & Classification Quarterly* 12, no.1:35–62 (1990).

USMARC to UNIMARC/Authorities: A Qualitative Evaluation of USMARC Data Elements

Marc Truitt

One of the major impediments to efficient exchange of machine-readable bibliographic information among national agencies has until recently been the lack of a UNIMARC authorities format. The publication of UNIMARC/Authorities addresses this need but at the same time raises questions about conversion of USMARC authority records for international distribution. Following a brief review of UNIMARC record structure, a group of USMARC name, title, and name-title authority records converted to UNIMARC is examined. Emphasis is on the adequacy with which USMARC records provide required and desirable UNIMARC data elements, and an assessment is made of the ease and completeness with which complex authority relationships are translated from USMARC to UNIMARC.

"A format is alive only if it is used and maintained."[1] With these words, Sally McCallum, Head of Network Development and MARC Standards at the Library of Congress (LC), summarized in 1985 the state of acceptance of UNIMARC, the international format for exchange of bibliographic data. Underlining LC's commitment to UNIMARC, she noted the Library's interest in cost reduction and resource sharing through exchange with other national libraries of machine-readable bibliographic records, as well as its frustration with the need to develop and maintain costly conversion systems in the absence of a generally accepted interchange standard.[2] McCallum identified several problem areas that would have to be addressed by UNIMARC's sponsor, the International Federation of Library Associations and Institutions (IFLA), if there was to be any likelihood of the format having widespread acceptance and implementation.

Among the needs McCallum identified was development of a complementary UNIMARC format for exchange of authority records among national libraries.[3] Although six years have passed since McCallum offered her assessment and authority records still are not being exchanged in UNIMARC format, the recent publication of *UNIMARC/Authorities* offers hope that this state of affairs might soon change.[4]

Given LC's stated desire to encourage wider use of UNIMARC, it can be

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expected that ultimately authority records produced using the *USMARC Format for Authority Data* will be made available in the IFLA format.[5] Thus, it is not premature to begin considering some of the problems that might be encountered in converting USMARC authority records to UNIMARC.[6] The study reported here involved the qualitative analysis of a group of USMARC authority records that exhibit various types of relationships among headings and tracings and in some cases among whole records. The aim was twofold, in that the inquiry was designed to evaluate (1) the adequacy of USMARC data from the perspective of required and desirable UNIMARC elements and (2) the ability of UNIMARC to preserve complex relationships among elements translated from the USMARC record.

HISTORICAL BACKGROUND[7]

The development of *UNIMARC/Authorities* has its origins in IFLA's Universal Bibliographic Control (UBC) Program.[8] UBC's programmatic statement, published in 1974, called for "promotion of a world-wide system . . . to make universally and promptly available, in a form which is internationally acceptable, basic bibliographic data on all publications issued in all countries."[9]

Among the plan's recommendations was one that each "national bibliographic agency" (i.e., national library) should assume "responsibility for establishing the authoritative form of names for its country's authors, both personal and corporate," as well as "authoritative lists" of such authors.[10]

One of the first achievements of the UBC program in "internationalizing" authority control was its work in promulgating standards for forms of personal and corporate names. By the early 1980s, it had published *Names of Persons: National Usages for Entry in Catalogues* and *Form and Structure of Corporate Headings*.[11] These standards both incorporated the Paris Principles' acceptance of use of the vernacular language and sought at the same time to encourage uniformity in heading construction.

By the late 1970s, UBC's attention had shifted to standardization of content and display of authority records used in international interchange. A Working Group on an International Authority System was formed in 1978 and charged with formulation of specifications for an international authority system and development of a UNIMARC-compatible format for the exchange of authority data, as well as methods for efficient and effective exchange of data.[12]

The working group, taking a cue from the International Standard Bibliographic Descriptions (ISBD), began work on a standard that would define the elements included in an authority record and introduce a system of ISBD-like punctuation. This had the effect of freeing the user from the need to know the language of an authority record in order to identify and utilize its individual data elements. Published in 1984 as *Guidelines for Authority and Reference Entries* (*GARE*),[13] this UBC standard provided models for creation and display (in print formats only) of authority records for personal and corporate names and uniform titles of anonymous classics.[14]

With the completion of the *Guidelines*, UBC established a Steering Group responsible for drafting a UNIMARC format for interchange of machine-readable authority data. Key requirements of the draft were inclusion of all elements specified by the *Guidelines* and conformity with both general and field-specific aspects of the UNIMARC bibliographic format. A preliminary draft was completed in 1988 and multiple revisions circulated during the following two years. The published version appeared in 1991. The format's adoption by national bibliographic agencies will signal technical achievement of a measure of international authority control.[15]

UNIMARC RECORD STRUCTURE

At the outset, it is appropriate to make a few general observations on the structure of *UNIMARC/Authorities* records and the data elements therein. Tables for principal record components, field tags, and comparisons to corresponding USMARC devices appear as tables 1–5.

Even a cursory examination of *UNIMARC/Authorities* clearly reveals the format's MARC-based parentage. Basic record structure is closely related to USMARC structure. For example, as can be seen from table 1, the USMARC Leader and UNIMARC Label show only a slight variation of allowable values at positions 5 and 6, and minor differences of notation (but identical meanings) in several other places. Of course, this similarity is not accidental. UNIMARC structure is based on a number of ISO (International Standards Organization) standards, many of which trace their heritage to the USMARC format.

Data values and strings in *UNIMARC/Authorities* are organized by category into nine areas called "functional blocks." Table 2 lists these blocks and their currently defined resident fields, and table 3 attempts to relate principal UNIMARC variable elements to corresponding USMARC tags. Many of these will appear strikingly familiar, the only significant change being the numeric values of the field tags themselves.

A significant difference between USMARC and UNIMARC is the former's essentially enumerative character. This can be compared with UNIMARC's attempt to express relationships synthetically. For

TABLE 1

COMPARISON OF USMARC LEADER AND UNIMARC LABEL

*Sample

```
                          Character Position
                       0    5    10   15   20 23
                       |    |    |    |    |  |
USMARC LEADER          00350nzƀƀƀ2200061nƀƀ4500

UNIMARC LABEL          00350nxƀƀƀ2200061ƀƀƀ45ƀƀ
```

			Valid Values	
Posit	**Description**	**Meaning**	**USMARC**	**UNIMARC**
0-4	Record length (350 char. here; zero fill)			
5	Record status	increase	a	
		corrected	c	c
		deleted-replaced	x	
		deleted-split	s	d
		deleted-other	d	
		new record	n	n
6	Type of record	authority	z	x
		reference		y
		gen'l explantry		z
7-9	[undefined (ƀƀƀ)]			
10	Indicator length count (always=2)		2	2
11	Subfield length count (always=2)		2	2
12-16	Base address (char. 61 here; zero fill)			
17	Encoding level	complete	n	ƀ
		incomplete	o	3
18-19	[undefined (ƀƀ)]			
20-23	Directory map	LOF length (always=4)	4	4
		SCP length (always=5)	5	5
		Implementation defined portion	0	ƀ
		[undefined]	0	ƀ

*Example adapted from: Robert H. Burger, *Authority Work: The Creation, Use, Maintenance and Evaluation of Authority Records and Files* (Littleton, Colo.: Libraries Unlimited, 1985), p. 76.

TABLE 2

UNIMARC/AUTHORITIES FUNCTIONAL BLOCKS AND DEFINED FIELDS[*]

0xx	Identification Block	
	001	Record Identifier
	005	Version Identifier
	015	International Standard Authority Data Number
1xx	Coded Information Block	
	100	General Processing Data
	150	Coded Data Field for Names [except personal names]
	152	Rules
	154	Coded Data Field for Uniform Titles
	160	Geographic Area Code
2xx	Heading Block	
	200	Heading - Personal Name
	210	Heading - Corporate [and Conference] Body Name
	215	Heading - Territorial or Geographical Name
	220	Heading - Family Name
	230	Heading - Uniform Title
	235	Heading - Collective Uniform Title
	240	Heading - Name-title
	245	Heading - Name-collective Uniform Title
	250	Heading - Topical Subject
3xx	Information Note Block [notes intended for public display]	
	300	Information Note
	305	Textual See Also Reference Note
	310	Textual See Reference Note
	320	General Explanatory Reference Note
	330	General Scope Note
4xx	See Reference Tracing Block	
	400	See Reference Tracing - Personal Name
	410	See Reference Tracing - Corporate Body Name
	415	See Reference Tracing - Territorial or Geographical Name
	420	See Reference Tracing - Family Name
	430	See Reference Tracing - Uniform Title
	440	See Reference Tracing - Name-title
	445	See Reference Tracing - Name-collective Uniform Title
	450	See Reference Tracing - Topical Subject
5xx	See Also Reference Tracing Block	
	500	See Also Reference Tracing - Personal Name
	510	See Also Reference Tracing - Corporate Body Name
	515	See Also Reference Tracing - Territorial or Geographical Name

[*] Adapted from UNIMARC/Authorities, draft, 11, 13. On p. 11, the titles for Functional Blocks 6 and 7 are transposed.

example, where USMARC defines two separate field types for headings for corporate bodies and conferences (meetings) (i.e., tags **x10** and **x11**), UNIMARC collapses these into a single field (**x10**) whose character is then specified by the first indicator.

The most immediately apparent differences are in the composition and arrangement of fields that make up fixed-length or coded data elements (USMARC 008; UNIMARC 1xx). These can be compared by reference to table 4. Many elements recorded in USMARC records, such as heading use restrictions (008/14–16) and reference evaluation (008/29) have no

TABLE 2 CONTINUED

UNIMARC/AUTHORITIES FUNCTIONAL BLOCKS AND DEFINED FIELDS

	520	See Also Reference Tracing - Family Name
	530	See Also Reference Tracing - Uniform Name
	540	See Also Reference Tracing - Name-title
	545	See Also Reference Tracing - Name-collective Uniform Title
	550	See Also Reference Tracing - Topical Subject
6xx		Classification Number Block
	675	Universal Decimal Classification (UDC)
	676	Dewey Decimal Classification (DDC)
	680	Library of Congress Classification (LCC)
	686	Other Classification Numbers
7xx		Linking Heading Block [contains alternate language/script equivalent of heading in 2xx, when cataloging rules permit parallel authorities. When a separate authority record exists for the alternate language/script heading, this field also carries explicit link to that record's identifying number]
	700	Linking Heading - Personal Name
	710	Linking Heading - Corporate Body Name
	715	Linking Heading - Territorial or Geographic Name
	720	Linking Heading - Family Name
	730	Linking Heading - Uniform Title
	740	Linking Heading - Name-title
	745	Linking Heading - Name-collective Uniform Title
	750	Linking Heading - Topical Subject
8xx		Source Information Block
	801	Originating Source
	810	Source Data Found
	815	Source Data Not Found
	820	Usage or Scope Information
	825	Example Under Note
	830	General Cataloger's Note
9xx		National [i.e., local] Use Block
		[Not for interchange -- field tags/values undefined.]

corresponding definition in UNIMARC; while some of these might be expendable, the omission of others suggests potential for future problems in record interchange. Some of these difficulties are explored below.

On the other hand, certain fixed-length variables essential to the processing of UNIMARC records are entirely absent from current USMARC authority records. The elements in question are language of cataloging (UNIMARC 100/9–11), primary and alternate character sets (UNIMARC 100/13–20), and script of cataloging (100/21–22). The script and alternate character set values may pose problems for authority records in which headings or references are not in the Latin alphabet. Fortunately, it will be seen below that these elements can probably be set as default values for the great majority of records in a conversion.

Similarly, UNIMARC places heavy emphasis on control subfields to express special relationships. While USMARC makes limited use of such devices (i.e., the instruction phrase, ǂi, and especially the relator, ǂw), they are numerous and may be used to express quite complex relationships in UNIMARC. The control subfields in *UNIMARC/Authorities* are:

ǂ0 Instruction phrase
ǂ1 Embedded subfield
ǂ2 Subject system code

TABLE 3

COMPARISON OF PRINCIPAL VARIABLE DATA ELEMENTS

DATA ELEMENT DESCRIPTION	USMARC	UNIMARC
Cataloging Source	040	801
Geographic Area Code	043	160
Library of Congress Classification Number	053	680
Dewey Decimal Classification Number	083	676
Headings and References:*		
-Personal Name	x00	x00
-Family Name	x00 3x	x20
-Corporate Name	x10	x10 0x
-Meeting Name	x11	x10 1x
-Uniform Title	x30	x30
-Collective Uniform Title	---	235**
-Name-title	xxx ǂt	x40
-Name-collective Uniform Title	xxx ǂt	x45
-Topical Subject	x50	x50
-Geographic Name	x51	x15
Complex See Reference - Subject	260	310***
Complex See Also Reference - Subject	360	305***
Series:		
-Dates and Volume Designation	640	---
-Numbering Peculiarities	641	---
-Numbering Example	642	---
-Place, Publisher	643	---
-Analysis Practice	644	---
-Tracing Practice	645	---
-Classification Practice	646	---
Complex See Also Reference - Name	663	305***
Complex See Reference - Name	664	310***
History Reference	665	300***
General Explanatory Reference	666	320
General Scope Note [public display]	680	330***
Source Data Found	670	810
Source Data Not Found	675	815
Epitome, General Cataloger's Note	678	830
Subject Example Tracing Note	681	825
Deleted Heading Information	682	835

*x = variable place holder.

**UNIMARC field 235 (Collective Uniform Title) exists only as an embedded field within a 245 (Name-Collective Uniform Title) heading or reference.

***Depending on the indicator used, these UNIMARC fields can specify either name-title or subject use of the heading.

ǂ3 Authority entry record number
ǂ5 Tracing control
ǂ6 Interfield linking data
ǂ7 Script
ǂ8 Language of cataloging

At the same time, there are curious lacunae among the defined values for some of the subfields. Two examples will suffice. There evidently is no value defined for "earlier *form* of heading" for the tracing control subfield (ǂ5). Thus, it appears impossible to distinguish between an "earlier heading" and an "earlier form of heading."[16] Also, the subfield that identifies interfield links has but two valid values, "alternate script" (**a**) and "other" (**z**). The need to link fields because of a nondefault *language* appears as likely to occur as that based on variant *scripts*, yet the former must be coded as "other."

METHODOLOGY AND DATA CONVERSION CONVENTIONS

For this study, a group of name, title, and name-title authority records was assembled from the Research Libraries Information Network (RLIN) Name Authority File. These records were not selected randomly, because the purpose of this study

TABLE 4

Comparison of Principal Fixed Length and Coded Data Elements

DATA ELEMENT DESCRIPTION	USMARC	UNIMARC	MANDATORY?
USMARC			
Record control number	001	001	Y
Date of last transaction	005	005	Y
Date record entered in file	008/0-5	100/0-7	Y
Direct/indirect geographic subdivn	008/6		
Romanization scheme	008/7	100/12	
[undefined]	008/8		
Kind of record	008/9		
Cataloging rules code	008/10	152 ǂa	
Subject heading system, thesaurus used	008/11	152 ǂb	
Series type	008/12	154 ǂa	
Series numbering	008/13		
Heading use--main or added entry	008/14		
Heading use--subject added entry	008/15		
Heading use--series added entry	008/16		
Type of subject subdivision	008/17		
[undefined]	008/18-27		
Type of governmental agency	008/28	150 ǂa	When req'd
Reference evaluation	008/29		
[undefined]	008/30		
Record update in process	008/31		
Undifferentiated personal name	008/32		
Level of establishment	008/33	100/8	
[undefined - formerly USMARC language of heading]	008/34-37		
Modified record code	008/38		
Cataloging source code	008/39		
UNIMARC			
Int'l Standard Authority Data Number		015	in development
Language of cataloguing		100/9-11	Y
Primary character set(s)		100/13-16	Y
Additional character set(s)		100/17-20	
Script of cataloguing		100/21-22	

is not to evaluate the frequency of potential USMARC-to-UNIMARC conversion problems. As noted previously, the purpose here is simply to convert a group of USMARC records that exhibit typical characteristics and thereby qualitatively identify some of the potential problem areas. A subsequent study could take the issues raised and test them against a representative sample.

Subject authorities were excluded, because by their very nature they introduce a variety of linguistic and conceptual problems that remain largely unaddressed by the several international authority control working groups. For example, IFLA's Working Group on an International Authority System, which compiled *GARE*, avoided topical subject headings entirely. At the same time, it should be noted that *UNIMARC/Authorities* is designed to support the exchange of topical authority records.

The RLIN records retrieved were downloaded to a personal computer. The records were massaged into an approximation of their USMARC form by stripping out the RLIN fixed-field labels and then restoring the resulting data string to USMARC field 008 order. As a general rule, few or no changes to the substance of the data were made. Incompletely coded data elements encountered in the records were left as found,[17] and information was added only when it seemed likely that it could be supplied as a conversion default[18] or when it seemed appropriate to draw an illustrative relationship permitted by UNIMARC but for which corresponding USMARC

TABLE 5

CONVERSION OF USMARC CONTROL SUBFIELD ‡w

POSIT	CODE	VALUE	UNIMARC
0	a	Earlier heading	‡5a
	b	Later heading	‡5b
	c	Acronym	‡5d
	*	Pseudonym	‡5e
	*	Real name	‡5f
	f	Musical composition	*
	g	Broader term	‡5g
	h	Narrower term	‡5h
	i	Reference instruction phrase	**
	n	Not applicable	-
	*	Other	‡5z
1	a	Name reference structure only	***
	b	Subject reference structure only	***
	c	Series reference structure only	***
	d	Name & subject reference structures	***
	e	Name & series reference structures	***
	f	Subject & series reference structures	***
	g	Name, subject & series reference structures	***
	n	Not applicable	-
2	a	Pre-AACR2 form	****
	e	Earlier established heading	****
	n	Not applicable	-
3	a	Reference not displayed	***
	b	Reference not displayed, use field 664	***
	c	Reference not displayed, use field 663	***
	d	Reference not displayed, use field 665	***
	n	Not applicable	-

*Value not defined.

**Embedded reference instructions can be generated using subfield ‡0.

***These types of references may be duplicated in UNIMARC by suppressing display of the simple reference (using ‡5_0) and creating the appropriate 3xx textual note.

****For this study, these values are considered roughly equivalent to that of "Earlier heading" (i.e., they are treated as if originally coded ‡wa).

data elements were lacking. The insertion of this more complex type of information by default during conversion is problematic. In all cases, supplied information appears in the records in underlined form.

Figure 1 illustrates a straightforward conversion that exhibits no special problems and essentially involves a character-for-character translation. Note that in the UNIMARC format forenames are separately subfielded.

In figure 2, the relationship between heading and reference given in USMARC 400 ‡wnna—i.e., that the reference represents a heading formulated before the adoption of the *Anglo-American Cataloguing Rules*, second edition (*AACR2*)—is best expressed by the value **a** (earlier heading) carried in ‡5 in UNIMARC field 400. There is no value in *UNIMARC/Authorities* that permits differentiation between an earlier heading and a heading formulated under earlier rules. Interestingly, the name change in this record in fact has nothing to do with *AACR2*: the USMARC record's tracing should have been coded **‡wnne** ("earlier established form of heading"), not **‡wnna** ("heading established under earlier cataloging rules").

In the first 410 field of figure 3, ‡5 values are used to identify and suppress display of the earlier form of the corporate name given in field 210. While not an issue in this record, one potential problem in

USMARC

```
Leader/05=n, /17=n
001 ƀƀnƀƀ84030721ƀ
005 ƀƀ19840816091349
008 ƀƀ071084n¦ƀacannaabƀƀƀƀƀƀƀƀƀƀƀ¦aƀaaaƀƀƀƀƀƀ
040 ƀƀǂaDLCǂcDLCǂdDLC
053 ƀƀǂaPS3553.L245
100 10ǂaClancy, Tom,ǂd1947-
400 10ǂaClancy, Thomas L.,ǂd1947-
670 ƀƀǂaHis The hunt for Red October, c1984:ǂbCIP t.p. (Tom Clancy) data sheet
     (Clancy, Tom (Thomas L., Jr.) b. 4/12/47)
```

UNIMARC

```
001 ƀƀnƀƀ84030721ƀ
005 ƀƀ19840816091349
015 [ISADN]
100 ƀƀǂa19840710aeng¦0103ƀƀƀƀba
152 ƀƀǂaAACR2ǂblc
200 ƀ1ǂaClancy,ǂbTom,ǂf1947-
400 ƀ1ǂaClancy,ǂbThomas L.,ǂf1947-
680 ƀƀǂaPS3553.L245
801 ƀ0ǂaUSǂbDLCǂc19840710
801 ƀ1ǂaUSǂbDLCǂc19840816
801 ƀ2ǂaUSǂbDLCǂc19840816
810 ƀƀǂaHis The hunt for Red October, c1984:ǂbCIP t.p. (Tom Clancy) data sheet
     (Clancy, Tom (Thomas L., Jr.) b. 4/12/47)
```

Figure 1. Personal Name.

USMARC

```
Leader/05=c, /17=n
001 ƀƀnƀƀ80050006ƀ
005 ƀƀ19851002111141
008 ƀƀ051980n¦ƀacannaabƀƀƀƀƀƀƀƀƀƀƀ¦aƀaaaƀƀƀƀƀƀ
040 ƀƀǂaDLCǂcDLCǂdDLC
100 10ǂaTaylor, Arlene G.,ǂd1941-
400 10ǂwnnaǂaDowell, Arlene Taylor,ǂd1941-
670 ƀƀǂaHer Cataloging with copy, 1976:ǂbt.p. (Arlene Taylor Dowell)
670 ƀƀǂaWynar, B.S. Introd. to cat. and class., 1985:ǂbCIP t.p. (Arlene G.
     Taylor)
```

UNIMARC

```
001 ƀƀnƀƀ80050006ƀ
005 ƀƀ19851002111141
015 [ISADN]
100 ƀƀǂa19800519aeng¦0103ƀƀƀƀba
152 ƀƀǂaAACR2ǂblc
200 ƀ1ǂaTaylor,ǂbArlene G.,ǂf1941-
400 ƀ1ǂ5aǂaDowell,ǂbArlene Taylor,ǂf1941-
801 ƀ0ǂaUSǂbDLCǂc19800519
801 ƀ1ǂaUSǂbDLCǂc19851002
801 ƀ2ǂaUSǂbDLCǂc19851002
810 ƀƀǂaHer Cataloging with copy, 1976:ǂbt.p. (Arlene Taylor Dowell)
810 ƀƀǂaWynar, B.S. Introd. to cat. and class., 1985:ǂbCIP t.p. (Arlene G.
     Taylor)
```

Figure 2. Personal Name (with Reference from Earlier Heading).

UNIMARC is the apparent lack of a defined data element replicating USMARC 008/29 (Reference evaluation). UNIMARC defines its field 152 ǂa to apply both to the "heading and its accompanying references." This could pose difficulties in any future global "flip" of headings such as took place with the implementation of *AACR2* in 1981.

Figure 4 illustrates how UNIMARC distinguishes between corporate and conference (meeting) headings and references. In USMARC, corporate names are tagged with fields **x10** and conferences are placed in **x11** fields. UNIMARC takes a somewhat more synthetic approach. Both types of names appear in **x10** fields, and the first indicator makes the distinction

USMARC

```
Leader/05=c, /17=n
001 ƀƀnƀƀ79011068ƀ
005 ƀƀ19890627132216
008 ƀƀ020579n¦ƀacannaabƀƀƀƀƀƀƀƀƀƀƀ¦aƀanaƀƀƀƀƀ
040 ƀƀǂaDLCǂcDLCǂdDLC
110 10ǂaNew Haven (Conn.).ǂbBoard of Aldermen
410 10ǂwnnaaǂaNew Haven.ǂbBoard of Aldermen
410 10ǂaNew Haven (Conn.).ǂbAldermen, Board of
670 ƀƀǂaIts Journal of the Board ... 1976, surrogate:ǂbt.p. (Board of Alder
     men of the City of New Haven)
670 ƀƀǂaKutz, C. Democracy in New Haven, c1988:t.p. (Board of Aldermen, 163
     8-1988; Board of Aldermen of the City of New Haven)
```

UNIMARC

```
001 ƀƀnƀƀ79011068ƀ
005 ƀƀ19890627132216
015 [ISADN]
100 ƀƀǂa19790205aeng¦0103ƀƀƀƀba
150 ƀƀǂa¦
152 ƀƀǂaAACR2ǂblc
210 01ǂaNew Haven (Conn.).ǂbBoard of Aldermen
410 01ǂ5a0ǂaNew Haven.ǂBoard of Aldermen
410 01ǂaNew Haven (Conn.).ǂbAldermen, Board of
801 ƀ0ǂaUSǂbDLCǂc19790205
801 ƀ1ǂaUSǂbDLCǂc19890627
801 ƀ2ǂaUSǂbDLCǂc19890627
810 ƀƀǂaIts Journal of the Board ... 1976, surrogate:ǂbt.p. (Board of Alder
     men of the City of New Haven)
810 ƀƀǂaKutz, C. Democracy in New Haven, c1988:t.p. (Board of Aldermen, 163
     8-1988; Board of Aldermen of the City of New Haven)
```

Figure 3. Corporate Name.

(**0** = corporate name; **1** = meeting name). The second indicator specifies the entry order of the elements in a name and is analogous to the first indicator of USMARC **x10** and **x11**.

The third see-from reference (field 410) carries the organization's initials. This relationship can be identified in UNIMARC through use of the value **d** (Acronym) in ǂ5. While it is also possible to show the same relationship in USMARC (with ǂwd), this was not coded in the present record. The UNIMARC relator is thus included for illustration only.

Interrecord links in UNIMARC rely both on a textual and an explicit numeric tie when the relationship between the records is one-to-one (as compared with a broader or narrower term relationship). In figure 5, the linking record number in field 500 ǂ3 refers to the authority record that gives **Twain, Mark, 1835–1910** as the authorized heading. It is not clear how such linking information might be included in converted USMARC authority records.

Subfield ǂ5 of the same field suppresses display of the simple reference and displays instead the textual note in field 305 (this is a simple translation of the USMARC field 500 ǂwnnnc and 663 pairing). While UNIMARC provides values for ǂ5 that identify linkages among "real names" and pseudonyms, "other" is used here because there is no machine-readable label in the USMARC record that characterizes the relationship.

In figures 6a and 6b—a pair of records created before the implementation of *AACR2*, several relationships are expressed (see figures 6a and 6b). The first see-from reference (field 410) in each carries the organization's initials, which, as was previously stated, can be identified in UNIMARC through use of the value **d** (Acronym) in ǂ5. Because this relationship was not coded in the USMARC records it seems doubtful that it could be translated in conversion. The UNIMARC relator is thus included for illustration only.

The records themselves are related through the 5xx fields; the relationship (earlier/later heading) is expressed with ǂwa or ǂwb in USMARC and ǂ5a or ǂ5b

USMARC

```
Leader/05=c, /17=n
001 ƀƀnƀƀ84038985ƀ
005 ƀƀ19871215073146
008 ƀƀ071684n¦ƀacannaabƀƀƀƀƀƀƀƀƀƀƀ¦aƀanaƀƀƀƀƀƀ
040 ƀƀDLCǂcDLCǂdDLC
111 20ǂaInternational Conference for Itinerant Evangelists.
411 20ǂaConference for Itinerant Evangelists, International
411 20ǂaItinerant Evangelists, International Conference for
411 20ǂaICIE
411 20ǂaInternational Congress for Itinerant Evangelists
670 ƀƀǂaFoster, D. Billy Graham, a vision imparted, c1984:ǂbt.p. (Internat
     ional Conference for Itinerant Evangelists; Amsterdam, the Netherland
     s, 7/12-21/83; Amsterdam 83) p. 95 (ICIE Amsterdam 83)
670 ƀƀǂaFoster, D. Amsterdam 86, c1987:ǂbcover (International Conference f
     or Itinerant Evangelists) p. 4, etc. (second conference, held in Amst
     erdam, 7/86; first International Conference for Itinerant Evangelists
     , 1983, Amsterdam)
670 ƀƀǂaIts (1st : 1983 : Amsterdam, Netherlands) The work of an evangelis
     t, c1984:ǂbt.p. (International Congress for Itinerant Evangelists, Am
     sterdam, The Netherlands) p. xiii, etc. (International Conference for
      Itinerant Evangelists)
```

UNIMARC

```
001 ƀƀnƀƀ84038985ƀ
005 ƀƀ19871215073146
015 [ISADN]
100 ƀƀ19840716aeng¦0103ƀƀƀƀba
150 ƀƀǂa¦
152 ƀƀǂaAACR2ǂblc
210 12ǂaInternational Conference for Itinerant Evangelists.
410 12ǂaConference for Itinerant Evangelists, International
410 12ǂaItinerant Evangelists, International Conference for
410 12ǂ5dǂaICIE
410 12ǂaInternational Congress for Itinerant Evangelists
801 ƀ0ǂaUSǂbDLCǂc19840716
801 ƀ1ǂaUSǂbDLCǂc19871215
801 ƀ2ǂaUSǂbDLCǂc19871215
810 ƀƀǂaFoster, D. Billy Graham, a vision imparted, c1984:ǂbt.p. (Internat
     ional Conference for Itinerant Evangelists; Amsterdam, the Netherland
     s, 7/12-21/83; Amsterdam 83) p. 95 (ICIE Amsterdam 83)
810 ƀƀǂaFoster, D. Amsterdam 86, c1987:ǂbcover (International Conference f
     or Itinerant Evangelists) p. 4, etc. (second conference, held in Amst
     erdam, 7/86; first International Conference for Itinerant Evangelists
     , 1983, Amsterdam)
810 ƀƀǂaIts (1st : 1983 : Amsterdam, Netherlands) The work of an evangelis
     t, c1984:ǂbt.p. (International Congress for Itinerant Evangelists, Am
     sterdam, The Netherlands) p. xiii, etc. (International Conference for
      Itinerant Evangelists)
```

Figure 4. Conference Name.

in UNIMARC. UNIMARC additionally permits a specific linkage to each record (note the related authority record numbers in 510 ǂ3).

Figures 7a and 7b illustrate a number of relationships that would presumably need to be preserved in USMARC to UNIMARC conversion. The first figure includes a previous form of heading that must be coded for suppression (USMARC 410 ǂwnnaa; UNIMARC 410 ǂ5a0). Both records carry the names of earlier and later incarnations of the corporate body in the see-also reference fields. These earlier and later names are identified within fields with control subfields USMARC ǂwa and ǂwb, and UNIMARC ǂ5a and ǂ5b; additionally, the UNIMARC 510 fields include related authority record numbers, linked with ǂ3. The existence of related topical subjects (USMARC 55x) in the USMARC record creates a special problem, as UNIMARC apparently does not include a specific device (such as USMARC's ǂwnb) to limit the application of a reference (in this case, to the subject reference structure only). No really satisfactory solution for this problem exists. Ultimately the relationship was

USMARC

```
Leader/05=c, /17=n
001 ƀƀnƀƀ88274848ƀ
005 ƀƀ19890502153126
008 ƀƀ040489n¦ƀacannaabƀƀƀƀƀƀƀƀƀƀƀ¦aƀaaaƀƀƀƀƀƀ
040 ƀƀ‡aDLC‡cDLC‡dDLC
100 10‡aSnodgrass, Quintus Curtius,‡d1835-1910
500 10‡wnnnc‡aTwain, Mark,‡d1835-1910
663 ƀƀ‡aWorks by this author are entered under the name used in the item.
     For a listing of other names used by this author, search also under ‡
     bTwain, Mark, 1835-1910
670 ƀƀ‡aNUCMC data from Stowe-Day Lib. for Kinney, S. Thomson-Kinney colle
     ction, 1851-1887‡b(name not given; corresp. by Samuel Langhorne Cleme
     ns (1835-1910) to descendants of Rev. Lyman Beecher)
670 ƀƀ‡aDAB, 1930‡b(Clemens, Samuel Langhorne, 1835-1910; humorist, noveli
     st; better known under psued. Mark Twain; while working as printer jo
     urneyman, ca. 1853 also used name Quintus Curtius Snodgrass; began to
      use Mark Twain in 1865)
```

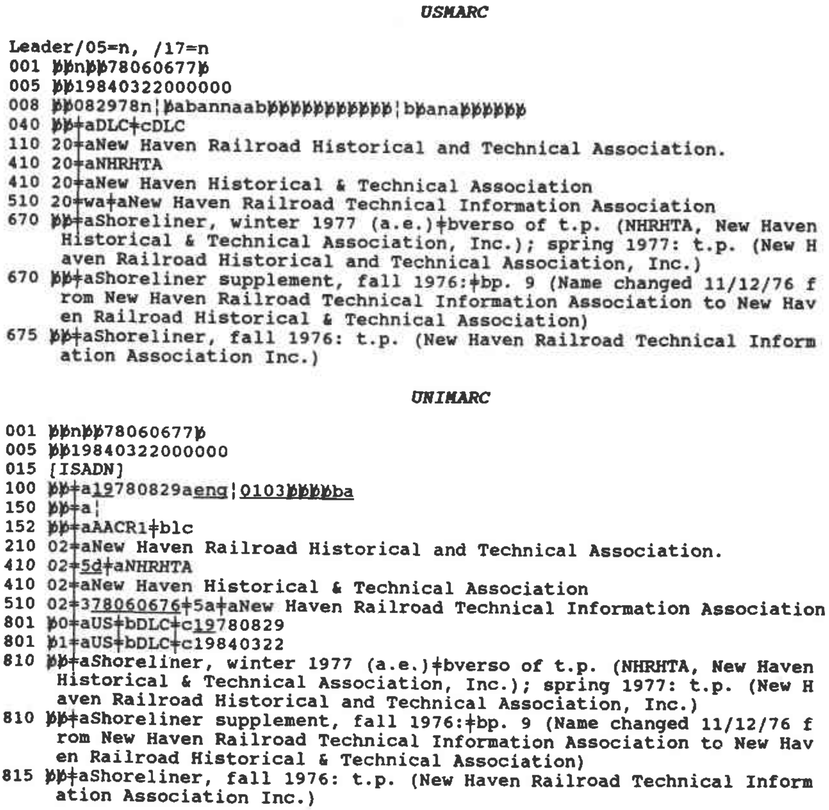
UNIMARC

```
001 ƀƀnƀƀ88274848ƀ
005 ƀƀ19890502153126
015 [ISADN]
100 ƀƀ‡a19890404aeng¦0103ƀƀƀƀba
152 ƀƀ‡aAACR2‡blc
200 ƀ1‡aSnodgrass,‡bQuintus Curtius,‡f1835-1910
305 0ƀ‡aWorks by this author are entered under the name used in the item.
     For a listing of other names used by this author, search also under ‡
     bTwain, Mark, 1835-1910
500 ƀ1‡379021164‡5z0‡aTwain,‡bMark,‡f1835-1910
801 ƀ0‡aUS‡bDLC‡c19890404
801 ƀ1‡aUS‡bDLC‡c19890502
801 ƀ2‡aUS‡bDLC‡c19890502
810 ƀƀ‡aNUCMC data from Stowe-Day Lib. for Kinney, S. Thomson-Kinney colle
     ction, 1851-1887‡b(name not given; corresp. by Samuel Langhorne Cleme
     ns (1835-1910) to descendants of Rev. Lyman Beecher)
810 ƀƀ‡aDAB, 1930‡b(Clemens, Samuel Langhorne, 1835-1910; humorist, noveli
     st; better known under psued. Mark Twain; while working as printer jo
     urneyman, ca. 1853 also used name Quintus Curtius Snodgrass; began to
      use Mark Twain in 1865)
```

Figure 5. Personal Name (Multiple Bibliographic Identities).

approximated by suppressing generation of the two simple topical subject references and then linking them to a UNIMARC textual see-also note (field 305). To preserve this relationship, a conversion program would have to examine byte 1 of ‡w in a USMARC record for a value indicating the nature of the restriction on the tracing's use and then generate an appropriate, predefined field 305. While UNIMARC does provide for specification of broader/narrower terms, ‡5z0 (**z** = other) is used here because a conversion program would be unable to recognize such a relationship when it had not been coded in the original USMARC record. In contrast to figure 5, which also uses such a note, the present case requires identification of which of the four 5xx fields are to be linked to the textual note. The interfield linking data subfield, ‡6, is used, followed by a one-letter "explanation code," a random, two-digit number common to the fields to be linked and the tag number of the linked field (305). The only defined values for the "explanation code" are **a** (alternate script) and **z** (other). Note that it is not necessary to repeat the tag number (305) in the ‡6 sequence embedded in the textual note. The random number common to both see-also from references and the textual note is the device that identifies the link.

The record shown in figure 8 introduces the UNIMARC approach to embedding author and title information. In this technique, the two principal elements (i.e., author and title) are constructed as separate, "stand-alone" heading fields,[19] complete with tags, indicators, and subfield identifiers. Then they are placed within another field—whose sole purpose is to carry embedded fields—to form the



```
                              USMARC

Leader/05=n, /17=n
001 ƀƀnƀƀ78060677ƀ
005 ƀƀ19840322000000
008 ƀƀ082978n¦ƀabannaabƀƀƀƀƀƀƀƀƀƀƀ¦bƀanaƀƀƀƀƀƀ
040 ƀƀǂaDLCǂcDLC
110 20ǂaNew Haven Railroad Historical and Technical Association.
410 20ǂaNHRHTA
410 20ǂaNew Haven Historical & Technical Association
510 20ǂwaǂaNew Haven Railroad Technical Information Association
670 ƀƀǂaShoreliner, winter 1977 (a.e.)ǂbverso of t.p. (NHRHTA, New Haven
     Historical & Technical Association, Inc.); spring 1977: t.p. (New H
     aven Railroad Historical and Technical Association, Inc.)
670 ƀƀǂaShoreliner supplement, fall 1976:ǂbp. 9 (Name changed 11/12/76 f
     rom New Haven Railroad Technical Information Association to New Hav
     en Railroad Historical & Technical Association)
675 ƀƀǂaShoreliner, fall 1976: t.p. (New Haven Railroad Technical Inform
     ation Association Inc.)

                              UNIMARC

001 ƀƀnƀƀ78060677ƀ
005 ƀƀ19840322000000
015 {ISADN}
100 ƀƀǂa19780829aeng¦0103ƀƀƀƀba
150 ƀƀǂa¦
152 ƀƀǂaAACR1ǂblc
210 02ǂaNew Haven Railroad Historical and Technical Association.
410 02ǂ5dǂaNHRHTA
410 02ǂaNew Haven Historical & Technical Association
510 02ǂ378060676ǂ5aǂaNew Haven Railroad Technical Information Association
801 ƀ0ǂaUSǂbDLCǂc19780829
801 ƀ1ǂaUSǂbDLCǂc19840322
810 ƀƀǂaShoreliner, winter 1977 (a.e.)ǂbverso of t.p. (NHRHTA, New Haven
     Historical & Technical Association, Inc.); spring 1977: t.p. (New H
     aven Railroad Historical and Technical Association, Inc.)
810 ƀƀǂaShoreliner supplement, fall 1976:ǂbp. 9 (Name changed 11/12/76 f
     rom New Haven Railroad Technical Information Association to New Hav
     en Railroad Historical & Technical Association)
815 ƀƀǂaShoreliner, fall 1976: t.p. (New Haven Railroad Technical Inform
     ation Association Inc.)
```

Figure 6a. Corporate Name (New and Old Headings Linked).

heading or reference desired. Each embedded field is identified by a subfield identifier (**∗1**) that precedes its tag. Conversion of USMARC name-title headings to this form does not appear to be a major difficulty; however, as will be seen below, name-title headings that use a "form" title (i.e., Works, Selections, etc.) are likely to pose significant problems.

The requirement for a sophisticated processing capability both in multiple languages and scripts is obvious in international record exchanges. Figure 9a illustrates UNIMARC's treatment of headings that are qualified by language. Recall that UNIMARC field 100 (character positions 9–11) specifies the language of cataloging, which in a USMARC-to-UNIMARC conversion would be supplied as a default (**eng**). Headings containing information not in the default language carry a subfield (**∗8**) that identifies the language in use. This figure represents a special (but not unusual) case. Because control subfields (such as **∗8**) must appear before all other data elements in a heading and the language qualification here applies only to the title (not to the entire sequence of embedded fields), a special arrangement becomes necessary. The reference 440 is linked to a following 440 tag (using the interfield linking subfield identifier ∗6), which in turn carries only a subfield **∗8** identifying the language used. As in Figures 7a-7b, the interfield linking subfield ∗6 is followed by a single-letter "explanation code," a random number common to the fields to be linked (in this case, 25) and the tag number of the field linked (230). A similar device—using ∗6a and ∗7—is employed with headings containing scripts other than the default value

USMARC

```
Leader/05=n, /17=n
001 ƀƀnƀƀ78060676ƀ
005 ƀƀ19840322000000
008 ƀƀ082978n¦ƀabannaabƀƀƀƀƀƀƀƀƀƀƀ¦bƀanaƀƀƀƀƀƀ
040 ƀƀǂaDLCǂcDLC
110 20ǂaNew Haven Railroad Technical Information Association.
410 20ǂaNHRTIA
410 20ǂaNew Haven Railroad Technical Association
510 20ǂwbǂaNew Haven Railroad Historical and Technical Association
670 ƀƀǂaShoreliner, fall 1974 (a.e.)ǂbt.p. (New Haven Railroad Technical I
     nformation Association Inc.) verso of t.p. (NHRTIA); spring 1976: t.p
     . (New Haven Railroad Technical Information Association Inc.) verso o
     f t.p. (New Haven Railroad Technical Association, inc., a non-profit,
     tax exempt org.)
670 ƀƀǂaShoreliner supplement, fall 1976:ǂbp. 9 (Name changed 11/12/76 fro
     m New Haven Railroad Technical Information Association to New Haven R
     ailroad Historical & Technical Association)
675 ƀƀǂaShoreliner, winter 1977: verso of t.p. (New Haven Historical & Tec
     hnical Association, Inc.)
```

UNIMARC

```
001 ƀƀnƀƀ78060676ƀ
005 ƀƀ19840322000000
015 [ISADN]
100 ƀƀǂa19780829aeng¦0103ƀƀƀƀba
150 ƀƀǂa¦
152 ƀƀǂaAACR1ǂblc
210 02ǂaNew Haven Railroad Technical Information Association.
410 02ǂ5dǂaNHRTIA
410 02ǂaNew Haven Railroad Technical Association
510 02ǂ378060677ǂ5bǂaNew Haven Railroad Historical and Technical Associati
     on
801 ƀ0ǂaUSǂbDLCǂc19780829
801 ƀ1ǂaUSǂbDLCǂc19840322
810 ƀƀǂaShoreliner, fall 1974 (a.e.)ǂbt.p. (New Haven Railroad Technical I
     nformation Association Inc.) verso of t.p. (NHRTIA); spring 1976: t.p
     . (New Haven Railroad Technical Information Association Inc.) verso o
     f t.p. (New Haven Railroad Technical Association, inc., a non-profit,
     tax exempt org.)
810 ƀƀǂaShoreliner supplement, fall 1976:ǂbp. 9 (Name changed 11/12/76 fro
     m New Haven Railroad Technical Information Association to New Haven R
     ailroad Historical & Technical Association)
815 ƀƀǂaShoreliner, winter 1977: verso of t.p. (New Haven Historical & Tec
     hnical Association, Inc.)
```

Figure 6b. Corporate Name (New and Old Headings Linked).

established in field 100, positions 21–22 (which for most USMARC records, would be set for the value (**ba**) indicating Latin script). Additional "explanation codes" beyond the two now defined would be very useful. The lack of a code for "alternate language" analogous to the **a** "alternate script" device seems especially curious.

Figure 9b is another application of the problem discussed in the previous example, with the exception that one of the texts is in the default language of the record (i.e., English). Thus, only the reference from the French title requires a linking 440 field to specify the alternate language. Once again, ǂ6 is used.

UNIMARC distinguishes between uniform titles and "collective uniform titles," intended to collocate records for selections, collections, etc. UNIMARC "collective uniform titles" are carried in field 235; the first indicator following the tag designates whether the title is for "complete collected works" (0), "selected works" (1), and "selections" (2). Because the same distinction no longer exists in USMARC records, where analogous title information may appear in either ǂt or ǂk, it is unclear how a conversion program will code this field and indicator set properly. Adding to the problem is the fact that ǂk, depending on context, may appear in either the title or the name portion of USMARC headings and tracings. Finally, ǂt can carry either

USMARC

```
Leader/05=n, /17=n
001 ƀƀnƀƀ82146346ƀ
005 ƀƀ19840322000000
008 ƀƀ011983n¦ƀacannaabƀƀƀƀƀƀƀƀƀƀƀ¦aƀanaƀƀƀƀƀƀ
040 ƀƀǂaDLCǂcDLC
110 20ǂaNew York State Library.ǂbSchool.
410 10ǂwnnaaǂaNew York.ǂbState Library School, Albany
410 20ǂaNew York State Library School
510 20ǂwaǂaColumbia University.ǂbSchool of Library Economy
510 20ǂwbǂaColumbia University.ǂbSchool of Library Service
550 ƀ0ǂwnbǂaLibrary schoolsǂzNew York (State)
551 ƀ0ǂwnbǂaAlbany (N.Y.)ǂxSchools
```

UNIMARC

```
001 ƀƀnƀƀ82146346ƀ
005 ƀƀ19840322000000
015 [ISADN]
100 ƀƀ19830119aeng¦0103ƀƀƀƀba
150 ƀƀǂa¦
152 ƀƀǂaAACR2ǂblc
210 02ǂaNew York State Library.ǂbSchool.
305 1ƀǂ6z07ǂaWorks about this body may also be found under the following
     headings:ǂbLibrary schools--New York (State);ǂbAlbany (N.Y.)--Schoo
     ls
410 01ǂ5a0ǂaNew York.ǂbState Library School, Albany
410 02ǂaNew York State Library School
510 02ǂ382146347ǂ5aǂaColumbia University.ǂbSchool of Library Economy
510 02ǂ382146344ǂ5bǂaColumbia University.ǂbSchool of Library Service
515 ƀƀǂ5z0ǂ6z07305ǂaAlbany (N.Y.)ǂxSchools
550 ƀƀǂ5z0ǂ6z07305ǂaLibrary schoolsǂyNew York (State)
801 ƀ0ǂaUSǂbDLCǂc19830119
801 ƀ1ǂaUSǂbDLCǂc19840322
```

Figure 7a. Corporate Name (New and Old Headings Linked; Complex Subject Usage Note).

USMARC

```
Leader/05=n, /17=n
001 ƀƀnƀƀ82146344ƀ
005 ƀƀ19840322000000
008 ƀƀ011983n¦ƀacannaabƀƀƀƀƀƀƀƀƀƀƀ¦aƀanaƀƀƀƀƀƀ
040 ƀƀǂaDLCǂcDLC
110 20ǂaColumbia University.ǂbSchool of Library Service.
510 20ǂwaǂaNew York State Library.ǂbSchool
510 20ǂwaǂaNew York Public Library.ǂbLibrary School
550 ƀ0ǂwnbǂaLibrary schoolsǂzNew York (State)
551 ƀ0ǂwnbǂaNew York (N.Y.)ǂxSchools
```

UNIMARC

```
001 ƀƀnƀƀ82146344ƀ
005 ƀƀ19840322000000
015 [ISADN]
100 ƀƀ19830119aeng¦0103ƀƀƀƀba
150 ƀƀǂa¦
152 ƀƀǂaAACR2ǂblc
210 02ǂaColumbia University.ǂbSchool of Library Service.
305 1ƀǂ6z09ǂaWorks about this body may also be found under the following
headings:ǂbLibrary schools--New York (State);ǂbNew York (N.Y.)--Sch
ools
510 02ǂ382146346ǂ5aǂaNew York State Library.ǂbSchool
510 02ǂ382146345ǂ5aǂaNew York Public Library.ǂbLibrary School
515 ƀƀǂ5z0ǂ6z09305ǂaNew York (N.Y.)ǂxSchools
550 ƀƀǂ5z0ǂ6z09305ǂaLibrary schoolsǂyNew York (State)
801 ƀ0ǂaUSǂbDLCǂc19830119
801 ƀ1ǂaUSǂbDLCǂc19840322
```

Figure 7b. Corporate Name (New and Old Headings Linked; Complex Subject Usage Note).

USMARC

```
Leader/05=c, /17=n
001 ƀƀnƀƀ79132704ƀ
005 ƀƀ19860403091635
008 ƀƀ111579n¦ƀacannaabƀƀƀƀƀƀƀƀƀƀƀ¦aƀaaaƀƀƀƀƀƀ
040 ƀƀǂaDLCǂcDLCǂdDLC
100 10ǂaTwain, Mark,ǂd1835-1910.ǂtAdventures of Tom Sawyer.
400 10ǂaTwain, Mark,ǂd1835-1910.ǂtTom Sawyer
670 ƀƀǂaHis Tom Sawyer and Huckleberry Finn, 1979, c1980:ǂbt.p. (containing
     the complete texts of The adventures of Tom Sawyer ...)
```

UNIMARC

```
001 ƀƀnƀƀ79132704ƀ
005 ƀƀ19860403091635
015 [ISADN]
100 ƀƀǂa19791115aeng¦0103ƀƀƀƀba
152 ƀƀǂaAACR2ǂblc
240 ƀƀǂ1200ƀ1ǂaTwain,ǂbMark,ǂf1835-1910.ǂ1230ƀƀǂaAdventures of Tom Sawyer
440 ƀƀǂ1200ƀ1ǂaTwain,ǂbMark,ǂf1835-1910.ǂ1230ƀƀǂaTom Sawyer
801 ƀ0ǂaUSǂbDLCǂc19791115
801 ƀ1ǂaUSǂbDLCǂc19860403
801 ƀ2ǂaUSǂbDLCǂc19860403
810 ƀƀǂaHis Tom Sawyer and Huckleberry Finn, 1979, c1980:ǂbt.p. (containing
     the complete texts of The adventures of Tom Sawyer ...)
```

Figure 8. Personal Name-Title.

USMARC

```
Leader/05=n, /17=n
001 ƀƀnoƀ89012571ƀ
005 ƀƀ19890920061455
008 ƀƀ090189n¦ƀacannaabƀƀƀƀƀƀƀƀƀƀƀ¦aƀaaaƀƀƀƀƀc
040 ƀƀǂaInUǂcInU
100 10ǂaTwain, Mark,ǂd1835-1910.ǂtAdventures of Tom Sawyer.ǂlHungarian
400 10ǂaTwain, Mark,ǂd1835-1910.ǂtTom Sawyer kalandjai
670 ƀƀǂaHis Tom Sawyer kalandjai, 1959.
```

UNIMARC

```
001 ƀƀnoƀ89012571ƀ
005 ƀƀ19890920061455
015 [ISADN]
100 ƀƀǂa19890901aeng¦0103ƀƀƀƀba
152 ƀƀǂaAACR2ǂblc
240 ƀƀǂ1200ƀ1ǂaTwain,ǂbMark,ǂf1835-1910.ǂ1230ƀƀǂaAdventures of Tom
     Sawyer.ǂmHungarian
440 ƀƀǂ6z25230ǂ1200ƀ1ǂaTwain,ǂbMark,ǂf1835-1910.ǂ1230ƀƀǂaTom Sawyer
     kalandjai
440 ƀƀǂ6z25230ǂ8hun
801 ƀ3ǂaUSǂbDLCǂc19890901
801 ƀ3ǂaUSǂbDLCǂc19890920
810 ƀƀǂaHis Tom Sawyer kalandjai, 1959.
```

Figure 9a. Personal Name-Title (with Reference from Title in Another Language).

"form" titles or distinctive titles. Perhaps the best possibility lies with a word-recognition routine that examines USMARC 1xx ǂt and ǂk. Figure 10 illustrates the problem.

Note the interrecord link (ǂ3) in field 540, referencing the authority record number for the heading traced (cf. figure 8). This information is not in the USMARC record above, and it is unclear whether this link could be provided in the course of conversion manipulation.

Figures 11a and 11b illustrate the principal problem encountered with "serial-like" authority headings. Because there are no UNIMARC fields currently defined for serials treatment data (USMARC 64x

USMARC

```
Leader/05=c, /17=n
001 ƀƀnƀƀ88041591ƀ
005 ƀƀ19900227160945
008 ƀƀ051688n¦ƀacannaabƀƀƀƀƀƀƀƀƀƀƀ¦aƀaaaƀƀƀƀƀƀ
040 ƀƀǂaDLCǂcDLCǂdDLC
100 10ǂaTwain, Mark,ǂd1835-1910.ǂtCelebrated jumping frog of Calaveras County
     .ǂlFrench & English
400 10ǂaTwain, Mark,ǂd1835-1910.ǂtJumping frog
400 10ǂaTwain, Mark,ǂd1835-1910.ǂtGrenouille sauteuse du comt_e de Calaveras
670 ƀƀǂaHis The jumping frog, 1987, c1985:ǂbp. 26 (La grenouiI̅le sauteuse du
     comt_e de Calaveras)
```

UNIMARC

```
001 ƀƀnƀƀ88041591ƀ
005 ƀƀ19900227160945
015 [ISADN]
100 ƀƀǂa19880516aeng¦0103ƀƀƀƀba
152 ƀƀǂaAACR2ǂblc
240 ƀƀǂ1200ƀ1ǂaTwain,ǂbMark,ǂf1835-1910.ǂ1230ƀƀǂaCelebrated jumping frog of
     Calaveras County.ǂmFrench & English
440 ƀƀǂ1200ƀ1ǂaTwain,ǂbMark,ǂf1835-1910.ǂ1230ƀƀǂaJumping frog
440 ƀƀǂ6z01230ǂ1200ƀ1ǂaTwain,ǂbMark,ǂf1835-1910.ǂ1230ƀƀǂaGrenouille sauteus
     e du comt_e de Calaveras
440 ƀƀǂ6z01230ǂ8fre
801 ƀ0ǂaUSǂbDLCǂc19880516
801 ƀ1ǂaUSǂbDLCǂc19900227
801 ƀ1ǂaUSǂbDLCǂc19900227
810 ƀƀǂaHis The jumping frog, 1987, c1985:ǂbp. 26 (La grenouille sauteuse du
     comt_e de Calaveras)
```

Figure 9b. Personal Name-Title (with Reference from Title in Another Language).

USMARC

```
Leader/05=n, /17=n
001 ƀƀnƀƀ82079570ƀ
005 ƀƀ19840322000000
008 ƀƀ061182n¦ƀacannaabƀƀƀƀƀƀƀƀƀƀƀ¦aƀaaaƀƀƀƀƀƀ
040 ƀƀǂaDLCǂcDLC
100 10ǂaTwain, Mark,ǂd1835-1910.ǂtSelections.ǂf1982
400 10ǂaTwain, Mark,ǂd1835-1910.ǂtMississippi writings
500 10ǂaTwain, Mark,ǂd1835-1910.ǂtAdventures of Tom Sawyer
670 ƀƀǂaHis Mississippi writings, c1982.
670 ƀƀǂaHis The adventures of Tom Sawyer; The adventures of Huckleberry
     Finn; Mark Twain's sketches ; ... 1982.
```

UNIMARC

```
001 ƀƀnƀƀ82079570ƀ
005 ƀƀ19840322000000
015 [ISADN]
100 ƀƀǂa19820611aeng¦0103ƀƀƀƀba
152 ƀƀǂaAACR2ǂblc
245 ƀƀǂ1200ƀ1ǂaTwain,ǂbMark,ǂf1835-1910.ǂ12352ƀǂaSelections.ǂk1982
440 ƀƀǂ1200ƀ1ǂaTwain,ǂbMark,ǂf1835-1910.ǂ1230ƀƀǂaMississippi writings
540 ƀƀǂ379132704ǂ1200ƀ1ǂaTwain,ǂbMark,ǂf1835-1910.ǂ1230ƀƀǂaAdventures
     of Tom Sawyer
801 ƀ0ǂaUSǂbDLCǂc19820611
801 ƀ1ǂaUSǂbDLCǂc19840322
810 ƀƀǂaHis Mississippi writings, c1982.
810 ƀƀǂaHis The adventures of Tom Sawyer; The adventures of Huckleberry
     Finn; Mark Twain's sketches ; ... 1982.
```

Figure 10. Personal Name-Collective UniformTitle (Linked to Related Record).

USMARC

```
Leader/05=c, /17=n
001 ƀƀnƀƀ42025440ƀ
005 ƀƀ19881117151711
008 ƀƀ040183n¦ƀacabbaaaƀƀƀƀƀƀƀƀƀƀƀ¦aƀanaƀƀƀƀƀƀ
040 ƀƀǂaDLCǂcDLCǂdDLC
100 10ǂaTwain, Mark,ǂd1835-1910.ǂtMark Twain library
430 ƀ0ǂaMark Twain library
643 ƀƀǂaBerkeleyǂbUniversity of California Press
644 ƀƀǂafǂ5DLC
645 ƀƀǂatǂ5DLC
646 ƀƀǂasǂ5DLC
670 ƀƀǂaThe mysterious stranger, [1981] c1969.
```

UNIMARC

```
001 ƀƀnƀƀ42025440ƀ
005 ƀƀ19881117151711
015 [ISADN]
100 ƀƀǂa19830401aeng¦0103ƀƀƀƀba
152 ƀƀǂaAACR2ǂblc
154 ƀƀǂab
240 ƀƀǂ1200ƀ1ǂaTwain,ǂbMark,ǂf1835-1910.ǂ1230ƀƀǂaMark Twain library
430 ƀƀǂaMark Twain library
801 ƀ0ǂaUSǂbDLCǂc19830401
801 ƀ1ǂaUSǂbDLCǂc19881117
801 ƀ2ǂaUSǂbDLCǂc19881117
810 ƀƀǂaThe mysterious stranger, [1981] c1969.
```

Figure 11a. Series and "Series-like" Headings.

fields), the information is lost. When the Library of Congress wrote its LCMARC-to-UNIMARC conversion program for bibliographic records, a policy decision was made to map LCMARC data not defined in UNIMARC to one of the latter's note fields. It would be possible to treat serial treatment information in a similar fashion, by mapping it into UNIMARC field 830 (general cataloger's note).[20] Alternatively, if UNIMARC's local-use block (9xx) were redefined as a mapping region for otherwise undefined values in interchange records, serial treatment information might be placed there.

CONCLUSION

The examples discussed above demonstrate that simple authority records involving one-to-one relationships between heading and tracing will generally translate from USMARC to UNIMARC without difficulty. More complicated relationships, such as those that call for the suppression of a tracing and the display of a textual note, also as a rule can be converted satisfactorily.

Very complex relationships, both between heading and tracing and among related records, are more problematic. As we have seen, coding and conceptual differences lie at both ends of any potential translation. Many of the most valuable links that UNIMARC seeks to establish are not presently coded in USMARC records: language specification, collective uniform title identification, and explicit interrecord links appear to be lacking both in the USMARC records examined and the format itself. Various explanations for these lacunae are apparent; for example, omission of data elements for the processing of foreign languages and scripts may in part reflect past ethnocentrism in Anglo-American cataloging practice.

More importantly, the lack of structural links among USMARC authority headings and records appears rooted in the fact that we traditionally have not recorded data elements in ways (if at all) that would today facilitate such links. For example, in the days of manual authority systems, there seemed little need for identification of the type of uniform title, because the difference between a distinctive and a form uniform title was clear to us (if, indeed, we bothered to think about it). Similarly, creation of explicit, numeric linkages among authority records would have seemed

USMARC

```
Leader/05=c, /17=n
001 ƀƀnƀƀ88506570ƀ
005 ƀƀ19890825081957
008 ƀƀ072889n¦ƀacacaaaaƀƀƀƀƀƀƀƀƀƀƀ¦aƀanaƀƀƀƀƀƀ
040 ƀƀǂaDLCǂcDLCǂdDLC
130 ƀ0ǂaSol. M. Malkin lectureship in bibliography
410 20ǂaColumbia University.ǂbSchool of Library Service.ǂtSol. M. Malkin l
     ectureship in bibliography
430 ƀ0ǂaMalkin lectureship in bibliography
643 ƀƀǂaNew YorkǂbBook Arts Press, School of Library Service, Columbia Uni
     versity in the City of New York
667 ƀƀǂaGive as a quoted note if not already recorded in the body of the e
     ntry.
670 ƀƀǂaWynne, M.G. The rare bk. collections at Yale, c1988:ǂbt.p. (Third
     Sol. M. Malkin lectureship in bibliography)
```

UNIMARC

```
001 ƀƀnƀƀ88506570ƀ
005 ƀƀ19890825081957
015 [ISADN]
100 ƀƀǂa19890728aeng¦0103ƀƀƀƀba
152 ƀƀǂaAACR2ǂblc
154 ƀƀǂac
230 ƀƀǂaSol. M. Malkin lectureship in bibliography
440 ƀƀǂ121002ǂaColumbia University.ǂbSchool of Library Service.ǂ1230ƀƀǂaS
     ol. M. Malkin lectureship in bibliography
430 ƀƀǂaMalkin lectureship in bibliography
801 ƀ0ǂaUSǂbDLCǂc19890728
801 ƀ1ǂaUSǂbDLCǂc19890825
801 ƀ2ǂaUSǂbDLCǂc19890825
810 ƀƀǂaWynne, M.G. The rare bk. collections at Yale, c1988:ǂbt.p. (Third
     Sol. M. Malkin lectureship in bibliography)
820 ƀƀǂaGive as a quoted note if not already recorded in the body of the e
     ntry.
```

Figure 11b. Series and "Series-like" Headings.

meaningless in a paper environment, so the only links (other than the redoubtable "x" and "xx" references on our cards) were those we drew in our minds. With the *USMARC Format for Authority Data*, this mindset carried over into a semiautomated environment through the creation of machine-readable records bearing all the information recorded on cards, but conspicuously lacking linkages previously dependent on human intervention. It is as though we assumed that automation would magically see to these links once our old records were replicated in binary code. In this sense then, *UNIMARC/Authorities* represents a rethinking of MARC-based authority control systems. Its creators have recognized—in large measure because of the very complexity of authority control at the international level—the need for identification of linkages and relationships among headings and records in a form that can be processed by computers.

Clearly, extensive enhancement work will be necessary if existing USMARC authority records are to be made available to the international bibliographic community in the UNIMARC format. Perhaps sophisticated word-recognition routines (for language and title identification) and database search-and-link operations (for the interrecord links) can be incorporated during the conversion process to alleviate some of the problems the USMARC records present. Inclusion of such information would both bring USMARC-originated records into closer conformity with IFLA standards and certainly increase their utility to foreign libraries. Further research in the problem of conversion of USMARC records might emphasize (1) thorough identification of desirable UNIMARC elements lacking in USMARC records, (2) frequency of occurrence for each lacking data element or relationship, and (3) system solutions that would enhance USMARC records with a minimum of human intervention.

At the same time, conversion of USMARC records will pose a number of policy questions that will have to be addressed. Some of these have been raised in the preceding examples. Are certain "housekeeping" data elements, such as serial treatment information, useful to an international audience in converted authority records? Should records that include unevaluated references be exchanged? And what of the numerous USMARC authority records whose headings pre-date *AACR2* (e.g., the records in figures 6a–6b)—are these to be considered authoritative?

Finally, more than simply forcing us to consider which *ad hoc* measures will render the current USMARC authority file usable in UNIMARC, the preceding exercise should prompt questions about the means by which we establish and identify relationships in the USMARC authorities format itself. Perhaps we should ponder UNIMARC-like format changes that would permit explicit links among related records and headings, and better identify data elements we wish our systems to manipulate. An encouraging sign in this connection is the recent addition of fields 066 and 880—which will facilitate the processing of alternate script data—to the USMARC authorities format.[21] Furthering this trend would add immeasurably to the utility of authority records created in USMARC, not only when they are converted to UNIMARC, but when they are processed by our own systems as well.

REFERENCES AND NOTES

1. Sally H. McCallum, "Using UNIMARC: Prospects and Problems," *International Cataloguing* 14:17 (1985).
2. Ibid. At the time of McCallum's article, LC was exchanging bibliographic data in machine-readable form with the National Library of Canada and the British Library. This necessitated development and maintenance of systems capable of conversion from USMARC to CanMARC or UKMARC, and vice versa.
3. The other two requirements McCallum listed were (1) the need for ongoing maintenance and (2) the completion of several UNIMARC features then in development, such as alternative script fields and facilities for encoding nonbook materials. The publication of updated UNIMARC bibliographic documentation in 1987 addressed many areas of the format that were then still vague and incomplete. See *UNIMARC Manual*, ed. Brian P. Holt, with the assistance of Sally H. McCallum & A.B. Long (London: IFLA Universal Bibliographic Control and International MARC Programme, British Library Bibliographic Services, 1987).
4. *UNIMARC/Authorities: Universal Format for Authorities*, recommended by the IFLA Steering Group on a UNIMARC Format for Authorities, approved by the Standing Committees of the IFLA Sections on Cataloguing and Information Technology. UBCIM Publications, New Series, v.2 (Munich and New York: Saur, 1991). At press time, the published version had not been seen, and for the present study a late prepublication draft of the format was utilized: *UNIMARC/Authorities: Universal Format for Authorities*, draft (IFLA Steering Group on a UNIMARC Format for Authorities, 1989-06-29). I am greatly indebted to Ms. McCallum for providing me with copies of this draft and other UNIMARC documents.
5. *USMARC Format for Authority Data: Including Guidelines for Content Designation*, prepared by Network Development and MARC Standards Office (Washington: Cataloging Distribution Service, Library of Congress, 1987).
6. Strictly speaking, the conversion would be from LCMARC (the internal MARC variant in use at the Library of Congress) to UNIMARC. For purposes of the present discussion, LCMARC is considered essentially equivalent with USMARC.
7. An extremely useful historical survey may be found in Tom Delsey's "Authority Control in an International Context," in *Authority Control in the Online Environment: Considerations and Practices*, ed. Barbara B. Tillett (New York: Haworth Pr., 1989), p.13–28. This volume of essays was previously published as *Cataloging & Classification Quarterly* 9, no.3 (1989).
8. Known today as the Universal Bibliographic Control and International MARC Programme (UBCIM), it was formed through the 1987 merger of UBC and the International MARC Programme.
9. Dorothy Anderson, *Universal Bibliographic Control: A Long Term Policy, a Plan for Action* (Pullach and Munich: Verlag Dokumentation, 1974), p.11.
10. Anderson, *Universal Bibliographic Control*, p.47.

11. For details, see *Names of Persons: National Usages for Entry in Catalogues*, 3d ed., comp. IFLA International Office for UBC (London: IFLA International Office for UBC, 1977) and *Form and Structure of Corporate Headings*, recommendations of the Working Group on Corporate Headings; approved by the Standing Committees of the IFLA Section on Cataloguing and the IFLA Section on Official Publications (London: IFLA International Office for UBC, 1980). A supplement to *Names of Persons* was published by UBC in 1980.
12. "IFLA Activities," *International Cataloguing* 13:37–38 (1984).
13. *Guidelines for Authority and Reference Entries*, recommended by the Working Group on an International Authority System; approved by the Standing Committees of the IFLA Section on Cataloguing and the IFLA Section on Information Technology (London: IFLA International Programme for UBC, 1984).
14. Delsey, "Authority Control," p.19–20; "IFLA Activities," p.37–38.
15. Linkage of variant headings remains a vexing problem. UBC's standards for personal and corporate name headings permit use of the vernacular for certain purposes. However, this is at odds with the principle that each national bibliographic agency should "establish the authoritative form" of such headings. *GARE* provided for assignment of an International Standard Authority Data Number (ISADN), to the record with the authoritative form of heading. The idea was that any national agency that modified the heading for its own use would then link the variant to the original through use of the ISADN, thus permitting true international control while recognizing the reality of varying national traditions and practices. However, the original working group was unable to develop an acceptable mechanism for assigning the number. Its model envisioned assignment by the responsible national agency. This has not been possible in part due to the inability of UBC or the agencies to develop a practical definition of a "national author."

    The still-unresolved status of this problem was highlighted in 1989 by a joint IFLA/UBC survey on national authority files conducted by Marcelle Beaudiquez and Françoise Bourdon of the Bibliothèque Nationale (BN) in Paris. The survey grew out of their work on the creation of an authority file for the BN, during which they noted deviations from IFLA/UBC recommendations in many authority files they examined. In particular, they discovered considerable redundancy among records distributed by differing national agencies, with only rare identification of an author's nationality. Summarizing the content of the survey's preamble and background, the editors of the UBCIM journal *International Cataloguing & Bibliographic Control* took national agencies to task for the "waste of effort" of establishing authorities for foreign authors "contrary to the recommendations of the 1977 Paris Congress on National Bibliographies . . . ." See "IFLA Survey of Authority Files," *International Cataloguing & Bibliographic Control* 17:64 (1988).
16. Consequently, when converting USMARC records one is forced to choose between ignoring a relationship such as "heading established under earlier cataloging rules" (**‡wnna**) or treating it simply as an "earlier established form of heading" (**‡wnne**).
17. The most obvious instances of this are related to USMARC 008/7 (Transliteration scheme) and 008/28 (Type of government agency), which appear on all RLIN authority records retrieved with a system-defined fill character (?). It is not clear whether this value replaces another analogous character in the original USMARC records or whether RLIN simply does not record the data when loading the LC records. In the examples that follow, this value is transcribed in fields 100/12 and 150 ‡a using the UNIMARC specified fill character (|). RLIN documentation includes all USMARC-defined values for these elements. See *RLIN Authorities Memory Aid (NAF and SAF): Includes USMARC Authorities Update* 3, 2d ed. (Mountain View, Calif.: The Research Libraries Group, Inc., 1991).

    A further minor problem encountered was the fact that most of the records found have a USMARC 005 (Date of Last Transaction) field length of fourteen, rather than sixteen, characters. It appears that decimal parts of a second were excluded from these records, which were left as-is.
18. Examples of such information includes the 19— portion of the date in UNIMARC 100/0–7 and 801 ƀ0, and the language of cataloging (100/9-11).
19. Note that in constructing see-also and see-also from references, the fields embedded within the 44x or 54x tracings are preceded by **2xx** (not **4xx/5xx**) tags.
20. For a description of LC's conversion of bibliographic records, see Sally H.

McCallum, "Library of Congress UNIMARC Conversion Programs," in *UNIMARC in Theory and Practice: Papers from the UNIMARC Workshop Sydney, Australia, August 1988*, ed. Sally H. McCallum and Winston D. Roberts (London: IFLA Universal Bibliographic Control and International MARC Programme, 1989), p.85–90.

21. Documentation for these fields is slated for dissemination in Update 4 of the *USMARC Format for Authorities Data*, currently in press.

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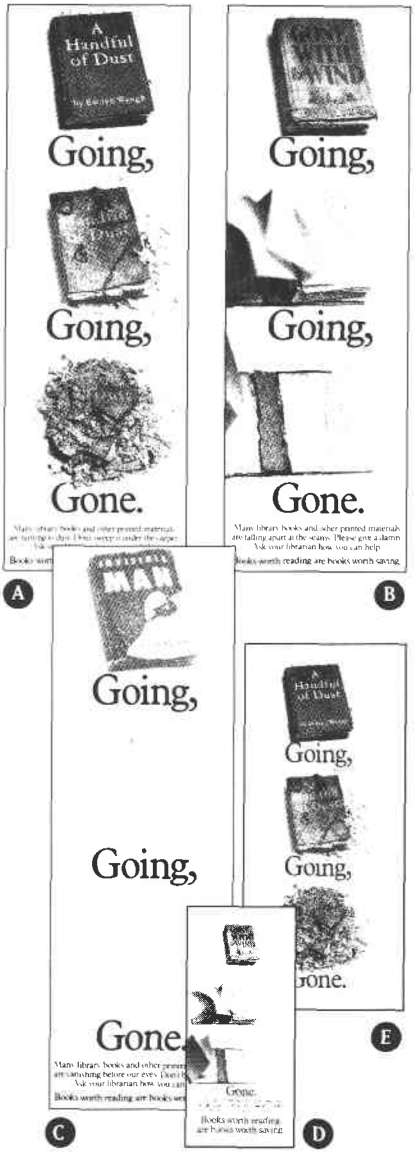
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The Integrated Library System of the 1990s: The OhioLINK Experience

Carol Pitts Hawks

The Ohio Library and Information Network (OhioLINK) will link the seventeen state-assisted university libraries in Ohio so that they will appear to the user as a single resource of some nineteen million volumes. Each institution will have the same state-of-the-art integrated library system feeding into a centralized database. Over the past three years, the OhioLINK network of subcommittees completed detailed evaluations of existing integrated library systems, including vendor demonstrations and site visits to the users of the systems being investigated. Contract negotiations with Innovative Interfaces, Inc., were completed in spring 1991, with implementation to begin in July 1991. These activities provided a wealth of information on the state of currently available integrated library systems. In this paper, experiences are synthesized into an analysis of what is still missing, functionally, from integrated library systems. In particular, concerns that are important to catalogers, acquisitions librarians, and collection management librarians are addressed.

In a presentation in 1985, Richard De Gennaro stated that

> The standard keynote speech at library technology conferences begins by describing, in glowing terms, the wonders of the new information processing technology and then exhorts the assembled company to embrace that technology or be left behind on the ash heap of the technological revolution.[1]

Visionary articles and futuristic papers on the prospects and promises of library technology have become a standard part of the library literature. Today, automation has become an integral part of the routine operations of many libraries. In this paper, the functional requirements of integrated library systems are examined. Many are currently within reach but not yet commonly available. Particular attention is devoted to the missing elements of library functionality, specifically concerning acquisitions, serials control, circulation, catalog maintenance, collection management, and the online public access catalog (OPAC).

The pace of technological change and innovation is phenomenal. De Gennaro indicates that "what might have been acceptable five years ago is inadequate today,

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and what looks advanced today will seem primitive in five years. As technology improves and costs go down, we librarians demand additional functions and capabilities and our requirements and expectations always exceed the offerings."[2] The request for proposal (RFP) process for acquiring a system continues to be the primary mechanism for ascertaining the functions available from automated systems. In this paper, eight integrated library systems are described as they existed or were planned in 1989, when the vendors responded to the RFP of the Ohio Library and Information Network (OhioLINK, formerly known as OLIS).

BACKGROUND—OHIOLINK

In 1986, the Ohio Board of Regents formed a Library Study Committee to address the problems of library space to house increased services and burgeoning collections. The board was reacting to a combined funding request from the state-assisted universities in the amount of $120 million for construction and renovation of libraries. The result of this committee's work was the OhioLINK Project, which as currently envisioned will:

1. link university libraries throughout the state so that they will appear to the user as a single resource of some nineteen million volumes,
2. be a gateway to the rapidly expanding world of information stored in electronic formats,
3. allow patrons to learn the status of those materials within minutes, with delivery of material provided by fax or truck within several days, and
4. have the option of managing the purchase of new books and journals in a significantly more efficient manner.[3]

Work began in earnest in 1988 with the establishment of three committees concerned with the views of users, librarians, and systems managers. In turn, five subcommittees were formed to look at the specific functional needs of acquisitions and serials control; catalog creation and maintenance; the online public access catalog; circulation, interlibrary loan (ILL), and document delivery; and collection development and management. OhioLINK's request for information (RFI) was released in February 1989 to more than sixty vendors with the purpose of soliciting information. As a result of information gleaned from this process, the OhioLINK RFP, consisting of more than 3,000 specifications, was released to approximately fifty vendors in August 1989. Eight vendors responded to the RFP by the October 20, 1989, deadline. Innovative Interfaces was selected for contract negotiation in June 1990. Contract signing occurred in May 1991, with system implementation at the first-phase universities beginning in July 1991.

METHODOLOGY

The eight systems as they existed or were planned in 1989 when the vendors responded to the OhioLINK RFP are described in this paper. The vendors examined are Ameritech (formerly OCLC Local Systems), CARL Systems, Data Research Associates (DRA), Geac, Innovative Interfaces Inc. (III), NOTIS Systems, Unisys, and VTLS. The enhancements described below reflect individual features that were not commonly available from most of the eight vendors. Individual features that might have become available since the submission of the RFP are not described. Rather, a specific moment in the history of these integrated library systems is pinpointed. In addition, it is assumed that these eight systems reflect the general state of the integrated library system marketplace for academic libraries. The capabilities and plans of other automated library systems are not addressed.[4]

The objective evaluation of RFP responses is difficult. First, there are often subtle differences between answers. Although some vendors use the terms "not available" and "not planned" interchangeably, these responses generally have a specific meaning that is applied with some consistency *within* an RFP response from a vendor but not necessarily *among* the different vendors. In contrast, the subtle differences between an answer of "planned, no date available" and "planned, due spring 1990" are apparent. The vendor with a due date has at least given some preliminary planning to the feature, and it usually holds a place on the vendor's development calendar. An answer of "planned, no date" can be either the vendor's legitimate acknowledgement that the specification has merit and will eventually be incorporated or simply a means of increasing the number of positive responses submitted on the RFP.

Second, there are variations in the philosophy each vendor follows when completing an RFP. One vendor identified every specification not currently available as "planned." In addition, that vendor provided little or no written elaboration except where specifically required. Such responses were evaluated with some healthy skepticism. In comparison, the vendor who responds honestly with a mixture of "not available" and "not planned" answers would be penalized. In another case, a remarkable similarity between the vendor's written documentation and the OhioLINK specifications was noted. For a particular subsystem, the module was almost entirely in planning. Thus, it was assumed that, if awarded the OhioLINK contract, the vendor intended to tailor the remainder of development for that module to the OhioLINK specifications.

Evaluation of responses must also take into account the primary market of the vendor responding. For example, if the vendor primarily serves large research libraries, its system might have many sophisticated features such as currency conversion for the acquisitions module. However, if the primary clientele is public libraries, features such as storage of search statements in the online catalog might not be available.

The vendor's responses sometimes reveal a company's proclivity for adding the latest technological bells and whistles while leaving the basic elements of the system incomplete. By comparison, another system might have covered the fundamentals very well but lacked the technological advances that generate more excitement.

Another complicating factor in RFP evaluation occurs when a vendor submits a response to individuals familiar with the system. The evaluation is then complicated by the users' ability to question the responses based on intimate knowledge of the system as it exists at their library. This can be both an advantage and a disadvantage for the particular system vendor. Although the evaluation of RFP responses is beset with difficulties, librarians should also view it as an opportunity to advance the frontiers of library system functionality.

RFP EVALUATION: GENERAL THEMES

Although the OhioLINK RFP is divided into multiple sections covering individual modules of the system, several key elements missing from most systems in use today occur throughout the document. These are the provision of documentation in machine-readable form, and the availability of microcomputer and word processing features such as windowing and spell-checking capabilities.

DOCUMENTATION IN MACHINE-READABLE FORM

OhioLINK identified two ways in which online documentation was deemed highly desirable: the ability to load the automated system documentation into a full-text file made accessible from various components of the system and the capability of accessing online versions of manuals, cataloging rules, format guides, etc., without exiting from the current process. Although system documentation was available online from five of the eight vendors (CARL, DRA, Geac, III, NOTIS), no vendor had taken the next step to develop interfaces with library users beyond the usual help screens. Thus the "spirit" of the specification as envisioned by OhioLINK planners was not met.

Although several of the vendors answered "available" to the second specification (the ability to consult online cataloging tools through "windowing"), the access they proposed was generally limited to viewing valid codes for cataloging fixed fields or online help screens. A project, the Cataloger's Assistant, reported by the OCLC Online Computer Library Center's Office of Research in its 1990 annual report comes closer to the intention of these specifications than the responses of the OhioLINK bidders. This prototype system is based on a Macintosh computer and provides access to the machine-readable versions of the *Dewey Decimal Classification*, the *Library of Congress Subject Headings* and the OCLC Online Union Catalog.[5] Of the vendors responding to OhioLINK, DRA seemed closest to the desired features in its plans to use *DEC Windows* in its programming. Little detail was provided by other vendors that were planning such access in the future.

WORD PROCESSING FEATURES

Word processing features such as windowing and spell-checking capabilities are rapidly gaining acceptance due to the popularity of such features in the office environment. However, incorporation of these features into integrated library systems has been slow. Staff and users have come to expect those same features to facilitate their use of library bibliographic systems. The OhioLINK specifications recognize that such access will compel libraries to use sophisticated microcomputer workstations. NOTIS, VTLS, CARL, and DRA can provide, or are developing, these proficiencies through the use of interfaces to sophisticated workstations from Sun, IBM, and Macintosh.

Windowing

In the cataloging environment, the OhioLINK libraries envision the use of windows for consulting authority files without leaving the record being processed, transferring duplicate data between records using a clipboard (or cut-and-paste) feature, displaying a database record and a potential duplicate record for comparison of fields, displaying cross-references and relevant subdivisions during subject authority work, and displaying relevant portions of cataloging rules while editing a problematic record. In the interlibrary loan area, windowing would permit the simultaneous display of patron interlibrary loan requests while searching the OhioLINK database, OCLC, and other databases to verify the request. In acquisitions and serials control, windows would facilitate the selection of an appropriate vendor from the vendor file while the order is displayed on the terminal. Charles Hildreth has predicted increased use of what he calls "'WIMPs' (Windows, Icons, Menus, and Pointers) at the user interface" in the online catalog as well.[6] Overwhelmingly, the vendors' responses to these various specifications concerning windowing for cataloging were that such access was planned through further development of workstation capabilities. NOTIS' plans for a technical services workstation holds the greatest promise in this area and will incorporate products such as an online version of the cataloging rules when it becomes available. Interestingly enough, the noncataloging specifications regarding windowing were met with at least five "not available" or "not planned" answers. When an answer of "planned" was given, generally no due date was set. However, VTLS is developing an intelligent front end for users. In addition, Unisys is marketing a personal computer–based tutorial that interfaces directly with an OPAC and uses windows. Nevertheless, it appears that the majority of the vendors do not anticipate extending these windowing capabilities beyond cataloging. PC-based workstations are more costly than dumb terminals, but the benefits in productivity and service improvement cannot be ignored.

Spelling Checker

The OhioLINK specifications call for a sophisticated, language-sensitive spelling checker to alert the technical services staff to typographical errors during editing and manual inputting of records in acquisitions as well as in cataloging. The specific features of this spelling checker incorporate the ability to add or delete new words from the dictionary, the ability to offer suggested spellings for the misspelled word, the ability to report spelling errors in report form as well as online, and the ability to define fields against which the spelling checker will be run. Essentially, the vendor responses to this specification were "not available" and "not planned." Conversely, CARL indicated that it is considering such a feature, but only for its UnCover product, which involves the keying of table-of-contents data into a database. Geac makes available an online dictionary for consultation, but the process is not an interactive one and the system cannot detect misspellings.

In the OPAC section of the specifications, a spelling checker that could be invoked by the user was required. Specifically, the feature was expected to identify misspellings and variant spellings in searches and allow corrections without beginning a new search. The vendors' responses and in general their objections to this particular specification were strongly worded. III, NOTIS, and Unisys suggested that authority control with cross-references was a better answer to this potential problem. III also advocated the success of its "synonymization" feature, which is transparent to the user and makes it possible for users to input variant words (such as "theater" and "theatre") and have the system automatically retrieve what is desired. The extremely large vocabulary in large research libraries would, unfortunately, defeat even the most sophisticated spelling checker. Walt Crawford suggested that lists of synonyms or online thesauri that can be consulted by the searcher who is not obtaining results might be the better solution.[6] Regardless of the method eventually selected, OhioLINK support continues for the fundamental principle that users should receive transparent or unobtrusive assistance in overcoming spelling deficiencies or typing errors.

RFP EVALUATION: CATALOG CREATION AND MAINTENANCE

Three major issues emerge from the analysis of the catalog creation and maintenance section of the OhioLINK specifications: augmented bibliographic records, including specialized access points and content information; the input, storage, retrieval, and display of non-Roman alphabets; and an automated review process to enhance quality control for cataloging.

AUGMENTED BIBLIOGRAPHIC RECORDS

Although the OhioLINK RFP does not explore the topic of augmented bibliographic records in great detail, the debate surrounding whether to augment bibliographic records with tables of contents and indexes rages on. Most recently, the issue of whether or not to enhance has created active debate on the *Public-Access Computer Systems Forum* (*PACS-L*) managed by Charles Bailey at the University of Houston.[7]

The fundamental questions in this debate are: "Can we enhance our standard records to improve online subject searching? And, even if we can, should we?"[8] The overall goal must be that "we do *not* increase the effort and expense of record creation unless we are gaining enhancements that cannot otherwise be achieved through good online catalog design or through improvements in our subject access tools."[9] On the one hand, administrators are pushing for "simplification" and minimal cataloging to reduce backlogs and manage the avalanche of published material. On the other hand, OPAC fans remark how wonderful it would be to have more entries and more notes. Walt Crawford concludes that "budgetary realities suggest that libraries can either include more items in online catalogs or enhance the contents of some items, but probably not both."[10]

The OhioLINK Project seeks to expedite the development of this enhancement by specifying the capability to optically scan printed cards, catalogs, and tables of contents. A digital page-scanning system would automatically read selected tables of contents, edit and format the contents based on rules programmed into the scanning software, and identify the appropriate catalog record to which the data are to be attached. CARL is engaged in the most active pursuit of this feature, related to the UnCover database, with a due date of winter 1990. Essentially, the other vendors responded with "not available" and "not planned" answers.

INPUT, STORAGE, RETRIEVAL AND DISPLAY OF NON-ROMAN ALPHABETS

The provision of access to non-Roman alphabets is a problem that, until recently, was of consequence to only a very small segment of libraries, primarily research libraries. Those research libraries usually have materials in these languages that are available nowhere else in the United States. With the increased availability of online catalogs via the Internet computer network, demand from scholars for access to these collections is increasing. In addition, the public libraries in this country are responding to the needs of a larger population of users whose language needs span the globe. Additionally, vendors are now experiencing pressure to support this feature as they expand their markets overseas. Romanization of Cyrillic alphabets has been very successful, resulting in improved access. However, the pressure is increasing to provide bibliographic access via vernacular scripts in Chinese, Japanese, Korean, etc.

Although display and printing of non-Roman characters are largely dependent on the output devices available, efforts persist to surmount the challenge of online entry of non-Roman characters. Character entry and encoding are still the fundamental hurdle in this area. As Crawford states:

> Non-Roman characters represent a whole range of problems, depending on the script involved. Some go from right to left rather than from left to right; some require much more detailed displays than Roman characters; some involve tens of thousands of character images.[11]

OCLC, the Research Libraries Information Network (RLIN), and UTLAS have done extensive work in the provision of East Asian vernacular (Chinese, Japanese, and Korean) through their systems. Great progress has also been made with Hebrew characters. Libraries must prepare for a future in which terminals will display these special characters and diacritics clearly and economically by retaining the characters in the database.

Because of the needs of Ohio libraries, the issue of non-Roman alphabets was covered extensively in the OhioLINK specifications. The specifications require the ability to accept, store, retrieve, search, and display non-Roman character sets. Reflecting the current state of this issue, most of the vendors suggested a research-and-development effort with the OhioLINK project concerning original-language displays. Standardization is the major determinant for vendors such as Unisys, which planned delivery of Chinese, Japanese, Korean, and Hebrew as early as winter 1990. Much progress has been made with these four alphabets because they are currently standardized by the National Information Standards Organization (NISO) or are under consideration. Progress has also been one result of the work of bibliographic networks such as OCLC, RLIN, and UTLAS. The vendors' future development in this area will be driven by the work that these networks pursue as well as by alphabets brought under NISO standardization. On the other hand, VTLS was actively developing Cyrillic languages due to its contract with the Lenin State Library in the USSR. Libraries and automated systems have only touched the tip of the iceberg where non-Roman alphabets are concerned. The future challenge of incorporating them in a general database is formidable.

REVIEW PROCESS TO ENHANCE QUALITY CONTROL FOR CATALOGING

As systems have assumed a larger role in the provision of access to library resources, increased attention has been focused on the quality, completeness, and accuracy of the database. Although systems provide a number of automatic error-detection routines, such as determining the absence or presence of certain types of data, records are reviewed by fewer staff members in an automated environment, and the accuracy of information cannot usually be determined by a computer. Errors that are not detected by the automated system can go uncorrected indefinitely.[12] Errors that occur in access points are of the utmost consequence because "even the tiniest error . . . may prevent retrieval of that information entirely and forever."[13] However, quality control and "'reasonable care' [are] not agonizing perfectionism."[14] While it is difficult to ignore the potential for errors that occur in less critical fields, most libraries cannot afford perfection.

To achieve this balance, the OhioLINK specifications are designed to save and route records for review automatically based on a table of options such as password or authorization level. Such a table could automatically save and route the work of a new or junior cataloger to a more senior cataloger, or the system could be programmed to route a particular type of record (bibliographic, holdings, authority) or a record in which a predefined number of errors was identified.

As expected, these features were largely "not available" from, or "not planned" by the various vendors. DRA came closest to meeting the spirit of these specifications by supporting an automatic-review process controlled by the authorization level of the operator. The other vendors generally supported automatic routing of all new cataloging or routing based on the issuance of a specific command when editing each record.

RFP EVALUATION: ONLINE PUBLIC ACCESS CATALOG

Although many of the issues presented above have a direct impact on the OPAC, the issues presented in this section deal specifically with features that OhioLINK libraries have prescribed as necessary for patrons' use. These include storage of search statements; provision of bibliographies in standard, user-selected formats; provision of computer-assisted instruction; availability of a design tool; and linkage of journal citations with holdings data.

STORAGE OF SEARCH STATEMENTS

The fundamental principle underlying the storage of search statements is the ability to reinitiate searches at a later date. The patron could reinitiate a search on command, but the system could also periodically resubmit stored search statements and retrieve matching citations that have been added since the last search statement submission. In effect, this new version of selective dissemination of information can be used to maintain a subject or author interest profile, which automatically alerts the patron to new material matching the profile. The most exciting potential for this feature is that once the original profile is constructed, additional staff and user time is not required to advance the identification of new material.

Although not commonly available in 1989, the vendor responses to these specifications were overwhelmingly positive resulting in answers of "planned, due ___" most often. CARL planned to introduce Expert Mode Searching, which would permit the user to save a search statement with access limited by identification number and password. The patron would also be asked to designate a "not needed after _____" field to expedite the deletion of obsolete search statements. VTLS expected to support such a feature only on its PC-based workstations and specifically mentioned its continuing development of the capability that allows for the execution of the search statement on records added since a particular date. However, two of the vendors were emphatically opposed to this requirement, with one stating that it was easier to re-enter the search than to search through a database of stored search statements for the correct one.

PROVISION OF BIBLIOGRAPHIES IN STANDARD, USER-SELECTED FORMATS

One of the greatest headaches for scholars is the formatting and reformatting of bibliographic information into the standard citation formats required by various publishers. Although many researchers have access to data-processing programs such as *ProCite* that automatically format these bibliographic citations, not all students have access to such sophisticated software. Thus OhioLINK planners specified that the system allow the user to generate a bibliography from a search result in a variety of standard bibliographic formats, including the *MLA Bibliography* and the *Chicago Manual of Style*. The system would display, download, save to a workspace, and print the formatted bibliography.

At least two vendors misinterpreted the intention of this requirement as indicating that the library could decide what elements were to be included in bibliographies and then all patrons would use that format. NOTIS provided the most extensive and accurate answer to this specification, stating that it uses *ProCite* software with formats available for the American National Standards Institute (ANSI), the American Publisher's Association (APA), the *Modern Language Association Style Sheet* (MLA), the *Chicago Manual of Style* and Kate L. Turabian's *A Handbook for Writers.*

PROVISION OF COMPUTER-ASSISTED INSTRUCTION

The terms *computer-assisted instruction* (CAI), *computer-based education,* and *computer-based training* cover a vast sphere of activity occurring in libraries today. Projects such as the HyperCard staff-training program developed at the University of Tennessee, the Information Machine and the Index Expert System developed at the University of Houston, and the Gateway To Information front end to the OPAC developed at the Ohio State University Libraries fit into the category of computer-assisted instruction. However, most of these projects to date have been instigated by individual libraries, not systems vendors.

Vendor responses to OhioLINK specifications revealed at least two projects under development. Both Geac and Unisys are developing self-paced demonstrations of their systems that will be particularly useful for new users. However, at least one vendor indicated that its system was not intended as a system for providing instruction in bibliographic research or other topics and was so easy to use that CAI products were not needed. Crawford provides a compelling argument to challenge this assertion:

> Online tutorials represent little overhead for a system and considerable value for the user. Even if a specific tutorial is used only once or twice a year, it will probably require only as much disk space as one bibliographic record and call for only a single index entry. Good online tutorials offer an inexpensive way to educate users when they want to be educated.[15]

AVAILABILITY OF A DESIGN TOOL

In the past, many projects such as online tutorials and other computer-based instruction projects were developed by systems designers and incorporated in a basic system product. To stimulate development at the library level, OhioLINK specifications require the availability of a design tool that can be used without vendor assistance. For example, such a design tool would enable the library to develop search flows based on system responses and inform the user that it had performed a search in another index. Thus a subject search with no results would move automatically to a title keyword search. Although most of the vendor responses to the general specification concerning the availability of a design tool were "available," it was not clear whether the design tool could be used without vendor assistance or advanced system-based knowledge. Ameritech and Unisys suggested a research and development project with OhioLINK, while CARL recommended that such a tool be provided for use by trained computer operators at the OhioLINK central site.

LINKAGE OF JOURNAL CITATIONS WITH HOLDINGS DATA

> Given the expanding use of online databases as a basic tool in the inquiry process, library patrons are increasingly approaching serial literature from the article-specific level . . . . Patrons are rarely concerned with how a title has been cataloged or whether the library owns a particular volume or issue of a serial. Rather, they want to determine whether or not the library has a desired article.[18]

To this end, OhioLINK patrons should be able to determine local and OhioLINK-wide holdings and availability of items retrieved through a search of the catalog. For example, when a citation is retrieved from a citation database search, holdings and availability can be determined as a second step in the search process but without requiring the user to enter the journal title separately.

The CARL system has addressed this issue most completely for the titles held in the UnCover database and those indexes that have been folded in or linked to UnCover. The strength of the CARL system lies in the relationship of check-in records to actual journal contents. NOTIS has also made progress in this area with the release of its Multiple Database Access System (MDAS) in 1990. MDAS allows NOTIS system users to search locally mounted databases with the same commands that they use to search the online catalog and then display local location, call number, order status, and holdings information for the journal in the OPAC.[17] Although Innovative Interfaces was still in the planning stage of this feature, the company viewed this as one of the most exciting parts of OhioLINK. Specifically, the location of an individual article would be provided seamlessly to the user through the linkage of the serials control module with the journal holdings file in the public catalog. Despite the fact that this specification was not widely available in 1989, it is ranked high on the list of enhancements for most vendors.

RFP EVALUATION: CIRCULATION, INTERLIBRARY LOAN, AND DOCUMENT DELIVERY

This portion of the RFP deals with a fundamental building block of the OhioLINK system. Through interlibrary loan and document delivery, the OhioLINK system plans to provide transparently library materials from the combined holdings of the state-assisted universities to scholars and researchers throughout Ohio. For example, a researcher from the University of Cincinnati can locate, request, and receive material from the University of Toledo within seventy-two hours.

OHIOLINK LOANS

The term *OhioLINK loans* is applied exclusively to the process of borrowing and loaning material among the OhioLINK libraries. When a patron initiates a checkout request for a title not held by the local library but owned within the OhioLINK system, the material in book form is planned for delivery within seventy-two hours, including items located in storage facilities. Journal articles are planned for delivery daily via telefacsimile or in digital form. The system is expected to evaluate the patron's status before approving the checkout or renewal. If the transaction is blocked, the patron will be prompted for an appropriate action, e.g., return the book, contact the circulation desk, etc. If the patron has requested delivery, the system will indicate the method of delivery, e.g., via campus mail or delivery to the patron's library for pickup. The system will track the progress of the delivery of the loan by assigning appropriate transit codes allowing the library to know where its material is at any given time. When an item is returned to a library other than the one from which it was checked out, the material can be discharged and assigned a transit code, thus relieving the patron of responsibility for the item. When the item reaches its home location, the transit code can be deleted.

In cases where the user locates a journal citation in an auxiliary database for an article that is not available in the patron's local library, the system will automatically respond with a menu-based ILL workform to facilitate the delivery of the document to the patron. The menu-based workform will contain only those fields the patron needs to complete, such as the bibliographic citation, maximum charge willing to pay, expiration date of the request, and source of the citation. The patron's workform will be reconfigured into a staff workform when it is retrieved by the ILL department. A cover page including fields for citation, patron information, date and time request was made, and the method of delivery requested by the patron will be printed by the system to accompany each journal article or chapter of a book being delivered. The cover page also will include blank fields to be completed by staff, such as date and time of fax transmission.

From the vendor responses it was apparent that supporting interlibrary loans as envisioned by OhioLINK was only "planned" for most systems in 1989. For example, transit codes beyond the basics of "in process" and "in cataloging" were not commonly available. However, the NOTIS system was developing an interlibrary loan module that would interface with the circulation component and would provide many of these requirements. The idea of providing cover pages to accompany article delivery was virtually nonexistent, with only four vendors answering "planned" and the remaining four answering "not available." Much work remains to bring this aspect of the OhioLINK system to fruition.

INTERLIBRARY LENDING AND BORROWING OUTSIDE OHIOLINK

Due to the size of the OhioLINK database (approximately nineteen million volumes), it is expected that a large proportion of the ILL needs of the institutions will be met within the system. In fact, at the Florida Center for Library Automation, which serves Florida state universities, 68 percent of the interlibrary borrowing and lending is reciprocal within the state.[18] Nevertheless, OhioLINK's commitment to participation in external interlibrary loan systems, particularly OCLC and National Library of Medicine (NLM), is reflected in RFP specifications that support electronic transmission of ILL requests to these external databases. The gains made through patron initiation of interlibrary loan requests would be obviated if OhioLINK were unable to transfer electronically those requests to OCLC or NLM as needed. The features sought for OhioLINK loans such as cover pages to accompany journal articles were required for external ILL processing as well.

III, Ameritech and NOTIS were the most outspoken in their support for interfaces with external interlibrary loan databases. However, the issue of whether formatted information could be uploaded and downloaded between the local system and the external database still needs to be explored. DRA showed strong support for the NISO Interlibrary Loan Data Elements Standard Z39.63, indicating its intention to implement once the standard was approved and adopted. Only two vendors indicated that interfaces with OCLC and NLM were "not available."

COPYRIGHT COMPLIANCE AND MONITORING

As cooperative collection development and access to information via citation databases increases, the role of libraries in guarding against infringement of copyright when requesting photocopies of journal articles will intensify and become more time consuming. It is imperative that future automated systems include mechanisms to monitor this activity and alert staff to potential violations. Passive reports listing requests for titles that approach the copyright limit require staff review to detect violations of free use.[19] Instead, OhioLINK's approach is a proactive one, in which the operator is alerted to requests that exceed fair use as they are being processed so that methods such as compensation to the Copyright Clearance Center (CCC) can be used to comply with the copyright law. Menu-based workforms to simplify copyright compliance may appear on the screen for staff completion in interlibrary loan as well as in reserve room operations. Reserve room records include data on the status of copyright permission for the copies such as "on-order from a copyright clearinghouse," "writing for permission," and "permission received and filed." CARL comes closest to meeting these specifications due to an arrangement with the CCC in connection with the *UnCover* project. At least four vendors responded "not available" with no additional explanation of plans to provide this enhancement. Those vendors who responded with an answer of "planned" also did not provide details.

PATRON-INITIATED FUNCTIONS

In a recent message to the *PACS-L Forum* concerning the Illinois library network ILLINET, Bernard Sloan reported that patron-initiated circulation transactions for November 1990 totalled 41,485.[20] These statistics support the belief that patron-initiated circulation is, and will be, a very popular feature of any automated system. The OhioLINK specifications stipulate a number of functions that can be initiated by the patron without staff interaction, including the ability to list items checked out to the patron and to renew materials. In addition, the system will block the renewal of material if exception conditions such as holds are detected and inform the patron of action required.

Although most of the OhioLINK vendors planned to permit patrons to display a list of the material checked out to them, several vendors exhibited more hesitation about patron-initiated functions such as renewal. For example, III expressed concern about public relations issues that might mitigate against having patrons process their own transactions as well as concern about how to protect patron passwords. DRA as well planned to limit most of these functions to staff only. On the other hand, CARL, reflecting the "planned" response of many of the other vendors, anticipated the release of a component in summer 1990 dealing with user-driven interlibrary loan that would meet most of these specifications. Unisys and VTLS had most of these features in their existing systems.

As an obvious extension of the concept of patron-initiated functions, the OhioLINK project supports the use of electronic mail and other means for patrons to interact with participating libraries. Patrons should be allowed to send signed or anonymous messages to the system expressing their complaints or offering suggestions. Ideally, the electronic mail system would be interactive with the catalog and other subsystems, allowing users and staff to transfer information located in the system to the electronic mail component to avoid rekeying of data. Patrons should be encouraged to place holds on material not currently available and to suggest items to be purchased. Finally, patrons should be given the opportunity to ask for reference assistance without coming to the library.[21] The primary advantages of electronic mail systems used in this manner are the savings in time and money; the ability to access the system from anywhere at any time, regardless of the library's location or hours of operation; and the immediate delivery of electronic mail.[22]

Although all the vendors responded that electronic mail systems were available with their systems, it was not clear to the OhioLINK planners that these systems were extensive enough to permit staff-to-user and user-to-staff communication at the levels required by OhioLINK. NOTIS proposed a somewhat different approach to this specification by recommending the development of electronic mail interfaces that would connect the universities' existing electronic mail systems. However, in a multi-institutional environment like OhioLINK, this could mean seventeen unique interfaces. In addition, any change of e-mail systems on an individual campus would require the development of a new interface to maintain the system proposed by NOTIS.

RFP EVALUATION: ACQUISITIONS AND SERIALS CONTROL

In acquisitions and serials control, the five areas that require attention include the conversion of existing records to a new system, interfaces with a variety of vendors and products, a refined secondary search match for duplicate detection, enhanced serials check-in, and serials renewal prediction and cost projections.

CONVERSION OF EXISTING RECORDS

Because a number of the OhioLINK libraries have already completed the tedious process of converting bibliographic, holdings, and check-in parameter data into an automated system, a general specification was included in the RFP to provide for the automated conversion of these records to the new system. Although the specifications call for the conversion of order records as well as serial check-in records, the high cost of conversion and the inevitable loss of information led to a decision by the Acquisitions/Serials Control Subcommittee to emphasize the importance of the serials check-in records and concede to vendor concerns that order conversion is not worth the time and effort required. Jean Houghton coined the phrase "payment system migration" for the process of electronically moving payment histories from one automated system to another.[23] Although not covered by the OhioLINK specifications, the ability to transfer these histories would greatly enhance the collection management analyses that are anticipated with OhioLINK without having to wait the requisite number of years to build that data into a new system.

The vendor responses to this specification have been predictable. Custom programming for each unique system to be converted was proposed with costs for such a project not included in the OhioLINK bid. VTLS was particularly confident that conversion could be completed through custom programming to map data from any system into the coded and free text fields of the USMARC Format for Holdings and Location. Others such as NOTIS were more emphatic in their "not available" answers.

INTERFACES

CD-ROM and online products such *Books in Print Plus* for publisher availability, Baker & Taylor's *BT LINK* for inventory availability, and Faxon's *BookQuest* and *SerialsQuest* for out-of-print and serial back issues are appearing in acquisitions and serials departments as stand-alone tools. "The full value of CD-ROM products will not be realized until they are completely integrated into technical service operations."[24] As a result, one of OhioLINK's goals is greater integration of these tools with the automated acquisitions and serials control system. The ability to download relevant information would eliminate the tedious verification and rekeying of data and reduce keying errors. In addition, the library is often precluded from using the electronic transmission features of these products because no interface with the acquisitions system exists.

Libraries should be able to issue cancellations, claims, and orders to vendors without leaving their automated systems. In response, systems should accept the online acknowledgement of these items, as well as status reports and claim responses, by automatically recording them in the library's system. At this stage in the automation of the claiming process, "only the first half of the transmission has been automated. There is automated support for sending claims to the vendor, but no such support exists for handling the vendor's response."[25]

DRA provided the most encouraging answer to these specifications, indicating a current project with Baker & Taylor to transmit orders and receive acknowledgements electronically. NOTIS was working on the acknowledgement of orders, cancellations, and claims with Faxon and EBSCO. CARL planned to release a new feature to facilitate the online transmission of claims and cancellation files to major vendors. NOTIS has also worked with Southwest Missouri State University and Blackwell North America to load new title announcements, including author, title, and subject descriptor, into a local area network environment. One can hope that the next step will be to incorporate these announcements into the OPAC or acquisitions system.

Online access to binders' automated systems with downloading and uploading capabilities as well as interfaces with institutional accounting systems were specified in the OhioLINK RFP. An online interface between the integrated library system's binding module and the vendor's automated system would eliminate the need for transferring information on paper. In addition, the library could more effectively track the progress of material at the bindery in response to patron requests for material. CARL was the only vendor who had an existing interface with a binder's system, specifically the Denver Book Bindery. The majority of the other vendors responded that this specification was "planned," usually involving custom programming as needed.

Interfaces with institutional accounting offices offer many opportunities to eliminate duplication of effort while improving the accuracy and synchronization of financial records. Because the library's internal system is an unofficial record, the often painstaking information recorded in it must become part of the official system, usually through a paper trail. Reconciliation of the official accounting reports with internal records rarely occurs in a timely fashion. Unfortunately, the barriers to communication between accounting systems are not always technical. There are many cases of the library being prepared to pursue this development but the institutional accounting office being resistent and adamant about the retention of longstanding paper methods. Again, custom programming is usually required for most vendors to develop interfaces with the myriad accounting systems encountered in institutional accounting offices. Both Unisys and NOTIS have existing interfaces with a single user.

REFINED SECONDARY SEARCH MATCH FOR DUPLICATE DETECTION

The first level of automatic duplicate detection occurs when a match on a title identifies a potential duplicate. However, for acquisitions and serials work with many common titles, this first level of detection is often inadequate. The OhioLINK specifications require a secondary search match using full or truncated author or main entry fields (1xx), publisher, and date. Although success in this area has eluded vendors for many years, it would appear from the vendor responses that progress is being made. For example, CARL uses an algorithm that compares OCLC number, Library of Congress Classification Number, International Standard Book Number/International Standard Serial Number, author, and title to determine potential duplicates. However, the process proposed by Geac comes closer to the goals of the OhioLINK requirement. Once a duplicate is located at the first level of detection, the operator will issue a command to search and compare the additional data elements of the two or more matching records. Only those records that continue to have matching elements are reported. The majority of the vendors simply present a list of potential duplicates (based on title matching) that the operator must evaluate.

ENHANCED SERIALS CHECK-IN

Three of the OhioLINK specifications reflect needed improvements in serials check-in—the implementation of the Serials Industry Systems Advisory Committee (SISAC) barcode, an alert to prompt the revision of check-in parameters, and the ability to upload serials holdings to union lists. The SISAC "barcodes on individual issues offer the possibility of scanning and automatically checking in issues, and so alleviate some of the danger of operator error."[26] The standard is in the final stages of approval. Kluwer, Elsevier, and Pergamon already either print the barcode on issues or are committed to its provision in the near future. Vendor responses to the requirement for support of the SISAC barcode reveal a "wait-and-see" attitude that is not uncommon until a standard is fully accepted. DRA expressed the sentiment behind most of the vendor responses by indicating its commitment to implementing SISAC standards, once approved.

In another enhancement to serials check-in, OhioLINK specifications require the provision of an alert that check-in parameters might need to be revised based on past receipt patterns. There has been much discussion in the serials community about overclaiming as a result of automated serials control systems. A delicate balance is required to maintain credibility with subscription agents and publishers while remaining fiscally accountable for serial expenditures and receipts. James Rush has asserted that mechanisms to predict the next issue should be accurate for 90 percent of the titles received. However, he indicates that, in reality, most are only 60 percent effective. Understandably, "a system that cannot accurately predict the next issue of a serial cannot reliably indicate when that issue is overdue and should be claimed."[27]

Vendor responses to this specification betray a lack of understanding of the intent of the issue. With the exception of CARL, the "planned" or "available" answers dealt only with the ability to maintain receipt history online. However, CARL's "spinning" feature comes closest to dealing with the difficulties in determining predictions. "Spinning" copies the previous year's receipt pattern to the next year, thus eliminating some of the guesswork inherent in the prediction process. Unfortunately, this process alone does not take into account internal or external circumstances that have affected the receipt of the title apart from its publication pattern.

Finally, the OhioLINK specifications require the ability to upload serials holdings from local systems to the OCLC Union List System; the NLM SERHOLD database; and other regional, local, and campus serials lists. Growing recognition that access is a realistic alternative to ownership, as well as the increased access to citation databases linked with journal holdings in the OPAC, has caused libraries to pay increased attention to the completeness and accuracy of serial holdings in their local systems. Legitimate fears that libraries will abandon their commitment to bibliographic networks such as OCLC and RLIN are being extended to the maintenance of union lists as well. This upload capability is the only way in which libraries can maintain their commitment to union lists on a long-term basis. Ideally, when a local system's detailed check-in is completed, the information can be collapsed and transmitted to a regional, state, or a national database.[28]

All of the vendor responses to this specification were "planned" or "not available." Specifically, CARL expressed confidence in its ability to transfer these data, given their success with other types of data transfer. Both Geac and NOTIS indicated that this feature was one of their long-term development goals. Unisys proposed cooperative development with OhioLINK while III correctly noted that OCLC currently could not accept such uploads on an ongoing basis.

SERIALS RENEWAL PREDICTION AND COST PROJECTIONS

Published cost studies are of limited use for most libraries in budget projection, because they reflect data on general costs and not the library's unique mix of titles. Predicting how much money is needed to cover serial renewals demands accurate data as the basis for further analysis by the automated systems. One of the fundamental difficulties with using data from automated systems for cost projection is consistency. This does not mean whether an invoice is paid in July or November, but rather whether it is paid on the same basis every year. Successful projection also depends on a large enough statistical pool to blur inconsistencies, or a small enough pool to do an item-by-item check.[29]

Given these competing needs and concerns, the OhioLINK specifications require the preparation of serial renewal cost projections by individual title. Calculations of projected costs use previous payment data and anticipated proportional increases supplied by the library. Individual variations based on data such as country of publication and payment history can be accommodated. Among the OhioLINK vendors, only Geac and III plan to provide this specification. The III program that calculates renewal costs was released in February 1991; however, its projections are not on an individual title basis. The Geac program is under development, but given the availability of this feature in the earlier Geac system, expectations for similar features are high.

RFP EVALUATION: COLLECTION DEVELOPMENT AND MANAGEMENT

The fundamental concept behind the specifications in the collection development and management section were to convey a sense of the data to be retained and the general types of analysis required. Much of this data is normally considered transitory and not retained by automated systems. It was the intention of OhioLINK to convey early in the vendor-selection process that new demands for storage and analysis would be required for the OhioLINK libraries to provide collection management data. Three areas pose a challenge to the current state of automation in this field: online mounting of the North American Collections Inventory Project (known as the Conspectus), collection measure analysis, and a collection managers' workstation.

NORTH AMERICAN COLLECTIONS INVENTORY PROJECT (CONSPECTUS)

The specifications call for the maintenance of an online North American Collections Inventory Project (NCIP) conspectus database, including subfiles, for conspectus data from each OhioLINK institution. By way of definition, NCIP "relies on a computer database of data about collection strengths and weaknesses where information about collections is recorded by LC call number."[30] For each subject descriptor, participating libraries assign a code (0 through 5) for their level of existing collection strength and a code for their current collecting intensity. The OhioLINK specifications go a step further in requiring the mounting and integration of that database with the OhioLINK system.

The vendor responses to this requirement were an odd mixture of "available," with the necessary caveats, and "not available." Although CARL answered "not available," it indicated its willingness to add this to its development schedule and elaborated that it had completed a collection-analysis project for CARL member libraries using the conspectus. III suggested that the database simply be mounted as another database on the system. The details of how to integrate the database with the online system were not addressed.

COLLECTION MEASURE ANALYSIS

Collection measure analysis includes the ability to collect and summarize data on individual institutions to provide comparative information. It is in this area that the transitory nature of much of the information desired comes into play. For example, the system should gather data on items circulated, their frequency of circulation, reserve room waiting time, in-house use, items sought but not found, and titles that have not circulated in a given period of time.

Recent serials cancellation projects have raised faculty awareness about the costs of selected journals. However, the review process would have been enhanced if circulation and usage information could have been integrated with the cost data from the acquisitions and serials control system. Add the incidence of ILL requests for titles, and libraries have a powerful, management-oriented tool to justify difficult decisions. In the final equation, it is the system's ability to capture and massage transitory data and "the sophistication of the report generation facility . . . [that] will determine how much of this information can be generated automatically and presented in a form that allows comparative assessment."[31]

Vendor responses to the entire collection management section revealed the inadequate level of understanding of collection management that exists within the vendor's organization. Ameritech's ties to OCLC resulted in its use of the OCLC Collection Analysis CD-ROM to address these specifications. Most of the other vendors anticipated using their report-generation software and cooperative development efforts to meet these specifications. In fact, CARL's answer that it can retrieve and analyze virtually any data, so long as they are available in defined fields and entered consistently, reveals the root of the problem—data must be in defined fields and entered consistently. None of these answers were entirely satisfactory to OhioLINK, and considerable attention is being paid to ensure that data are captured initially so that analysis capabilities can be added to the system at a later date.

COLLECTION MANAGERS' WORKSTATION

Although the OhioLINK specifications did not call for a collection manager's workstation as envisioned here, the groundwork was laid to provide the elements and linkages necessary to see such a project to fruition. Increasingly, the interfacing and analysis capabilities of automated systems are moving libraries closer to this reality. For example, artificial intelligence techniques could be applied to bibliographic databases in the acquisitions environment to "facilitate collection development by suggesting titles for purchase, to develop profiles of buying patterns, or to produce selection lists somewhat like an approval plan."[32] After searching external databases such as *BIP Plus*, the collection manager could download relevant data on availability, including reviews, into a selection request file. Once a final decision to purchase is made, those data could be uploaded to the acquisitions system, which would verify the electronic signature of the collection manager and authorize the addition of the title to the order file. Selection profiles could be developed by downloading enrollment data, research grants and project data, and data on faculty productivity from administrative academic records.[33] Collection development policies and manuals describing policies and procedures for acquisitions and collection management in machine-readable form would be readily at hand for consultation.[34] Lynden and Welsch provide extensive descriptions of additional features imagined as a part of these workstations.[35,36]

CONCLUSION

The ILS as it existed in 1989 lacked general features such as documentation in machine-readable form and sophisticated word processing features. Augmented bibliographic records, non-Roman alphabets, and enhanced quality control for the cataloging process represented the future for cataloging modules. Capabilities for enhanced user features such as storage of search statements and linkage of journal citations with holdings data can be expected as standard features in the 1990s. Circulation development can be expected to focus on extended resource sharing, copyright compliance, and patron-initiated functions. Acquisitions, serials control, and collection management systems will be enhanced to improve access to material at all stages of the selection and acquisition process.

Existing integrated library systems establish a firm foundation from which libraries can build for the future. Many of the early growing pains are behind us, but the next steps will have their own dilemmas, turning points, and obstacles to be overcome. As Richard De Gennaro has said:

> The point is that our field thrives on visions. Some of those visions turn out to be pipe dreams; others . . . eventually become realities—one way or another. The fun and frustration of it all is that it is so hard to distinguish the pipe dreams from the prophetic visions . . . . Our task is to pool our knowledge so that we can do a better job of telling one from the other.[37]

The OhioLINK Project is the beginning of that vision for the state of Ohio.

REFERENCES AND NOTES

1. Richard De Gennaro, "Integrated Online Library Systems: Perspectives, Perceptions, and Practicalities," in *Libraries, Technology, and the Information Marketplace: Selected Papers* (Boston: Hall, 1987), p.229.
2. Ibid., p.230.
3. The Ohio Board of Regents, *OLIS: Connecting People, Libraries, & Information for Ohio's Future* (Columbus, Ohio: The Ohio Board of Regents, 1990), p.2–3.
4. Although the DRA RFP response was marked as containing proprietary information, DRA president Michael Mellinger has agreed that the information can be included in this article. DRA (as well as the other vendors) have moved forward with planned enhancements, and updated information should be obtained when making a current assessment of these systems.
5. *Annual Review of OCLC Research: July 1989–June 1990* (Dublin, Ohio: OCLC Online Computer Library Center, Inc., 1990), p.6–8.
6. Walt Crawford, *Patron Access: Issues for Online Catalogs* (Boston: Hall, 1987), p.189.
7. This electronic discussion group is accessible through subscription at BITNET address LISTSERV@UHUPVM1.
8. Carol A. Mandel, "Enriching the Library Catalog Record for Subject Access,"

Library Resources & Technical Services 29:5 (1985).

9. Ibid., p.7. Emphasis in the original.
10. Crawford, *Patron Access*, p.21.
11. Ibid., p.96.
12. Judith Hudson, "Cataloging for the Local Online System," *Information Technology and Libraries* 5:25 (1986).
13. Karen L. Horny, "Quality Work, Quality Control in Technical Services," *Journal of Academic Librarianship* 11:206 (1985).
14. Ibid., p.210.
15. Crawford, *Patron Access*, p.155.
16. Rian Miller-McIrvine, "Challenges for Serials Automation," *Library Resources & Technical Services* 33:166 (1989).
17. "NOTIS Links Library Holdings with Locally-Mounted Database Records" [computer file]. Houston, Texas: *Public-Access Computer Systems News* [electronic journal] 1, no.9 (Sept. 6, 1990): PACS-L@UHUPVM1.BITNET.
18. Anne Marie Allison, "Managing Collections in an Automated Network Environment," *Collection Building* 9, no.2:30 (1989).
19. Barbara Beaton and Jay H. Kirk, "Applications of an Automated Interlibrary Loan Log," *Journal of Academic Librarianship* 14:27 (1988).
20. Bernard Sloan, "Patron-Initiated Circulation Transactions," PACS-L (Public-Access Computer Systems) Dec. 14, 1990 (LISTSERV@UHUPVM1).
21. Crawford, *Patron Access*, p.7–10.
22. Amy Chang, "Computerizing Communication for Interlibrary Loan," *College & Research Libraries News* 50:994 (1989).
23. Jean Houghton, "Automating Serials Payments: The Right Tool for the Job," *The Serials Librarian* 13, nos.2/3:112 (Oct./Nov. 1987).
24. Brian Campbell, "Whither the White Knight: CD-ROM in Technical Services," *Database* 10, no.4:24 (Aug. 1987).
25. Brian Aveney and Luba Heinemann, "Acquisitions and Collection Development Automation: Future Directions," *Library Hi Tech* 1, no. 1:50 (Summer 1983).
26. Janet Padway, "Serials Automation: Examining the Problems," *The Serials Librarian* 11, nos.3/4:36 (Dec. 1986–Jan. 1987).
27. James E. Rush, "Automated Serials Control Systems," *Serials Review* 12, nos.2/3:100 (Summer–Fall 1986).
28. Ronald A. Gardner, "The Evolution of Automated Serials Control," *The Serials Librarian* 11, nos.3/4:82 (Dec. 1986–Jan. 1987).
29. Houghton, "Automating Serials Payments," p.108.
30. Frederick Charles Lynden, "Collection Management by Automation," *Library Acquisitions: Practice & Theory* 13:180 (1989).
31. David Toll, "Selection and Acquisition of Serials: The Impact of New Technology," *IFLA Journal* 14:315 (1988).
32. Norman Desmarais, "Microcomputer-Based Acquisitions Systems: Where Have We Come From; Where Are We Going?" *The Acquisitions Librarian* 1:283 (1989).
33. Carol E. Chamberlain, "Fiscal Planning in Academic Libraries: The Role of the Automated Acquisitions System," in *Advances in Library Administration and Organization*, v.6, ed. Gerard B. McCabe and Bernard Kreissman (1986), p.147–48.
34. Lynden, "Collection Management," p.181.
35. Ibid., p.181–82.
36. Erwin K. Welsch, "Back to the Future: A Personal Statement on Collection Development in an Information Culture," *Library Resources & Technical Services* 33:29–36 (1989).
37. De Gennaro, "Integrated Online Library Systems," p.234.

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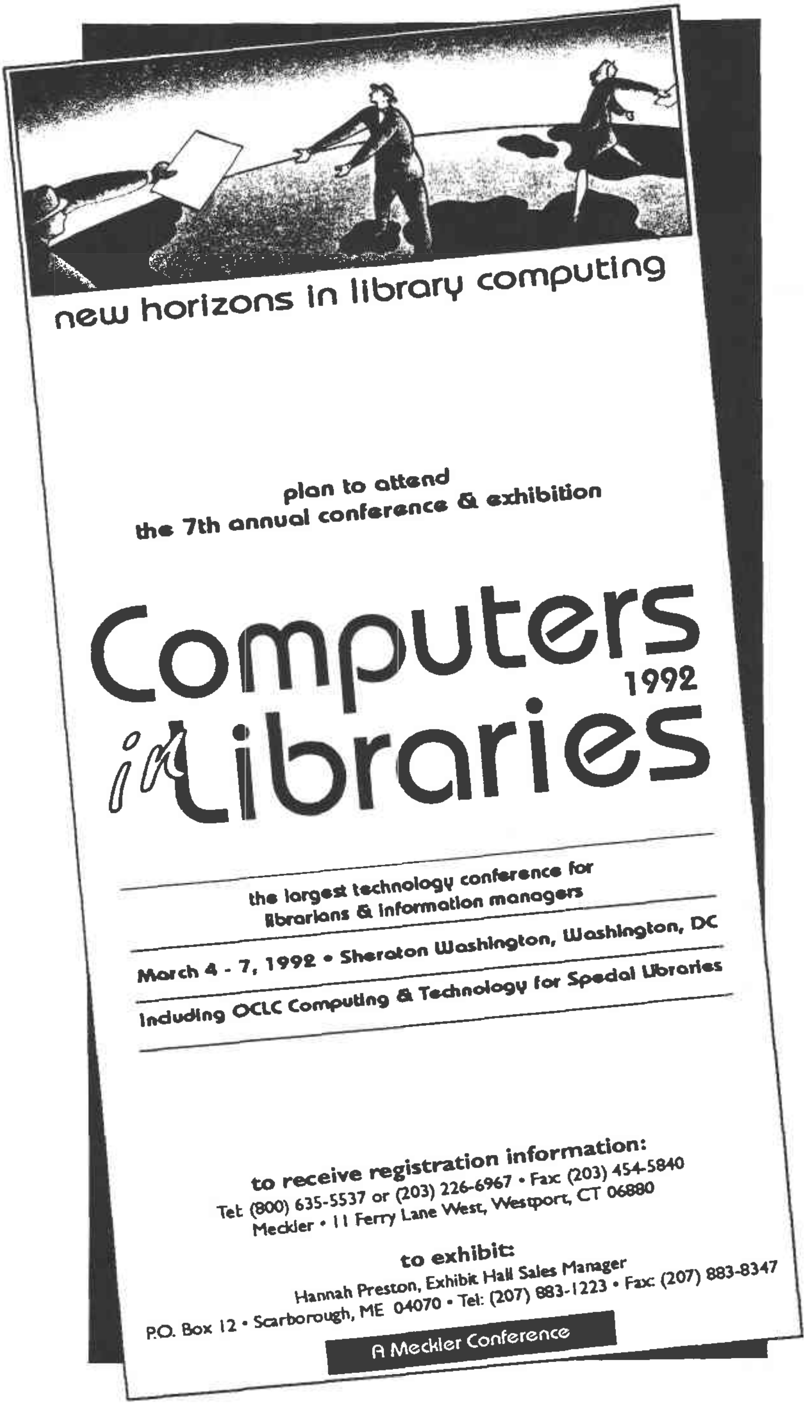

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Staff Time and Costs for Cataloging

Dilys E. Morris

Automation is having a major impact on technical services, but it is unclear whether reductions in staffing and costs will result. In 1987 the Iowa State University Library Technical Services Division began a longitudinal study to investigate the times spent at tasks as automation expanded. During sample weeks all staff record the time worked according to defined tasks and within cost centers. Salary data are also recorded for the sample weeks, which allows the assignment of costs. In this article, results from the first three years of sampling are reported. Results show the proportion of time spent at tasks, trends in changes over time, and per-title cataloging time and costs.

For years now, automation has had a major impact on technical services, and will continue to do so. Very different views of its effect on technical services staffing exist. One view expressed by Phelps and Getz, based on their cost study research, is that the "scope for reduction of labor costs in technical services due to automation is relatively limited as long as libraries continue to acquire and own materials in traditional ways."[1] However, within the Iowa State University Library (ISUL) there is the perception by some, and certainly the hope by many, that automation will allow reductions in staffing and costs within traditional technical services, providing the opportunity for shifting staff resources to new service areas. Research on the longitudinal impact of automation on technical services personnel time and costs will shed light on what is happening to staffing costs and patterns.

In 1987 the Technical Services Division of the Iowa State University Library began a longitudinal study of all personnel time and costs. Staff record all time worked in a week according to defined tasks grouped within cost centers. Exact salaries with benefits are collected for each staff member. From these data the amount of time spent at tasks and within cost centers, as well as the associated costs, can be calculated. The data analyzed in this article cover sixteen sample weeks over a three-year period.

The purpose of the research project is to investigate changes in task times, staffing patterns, and personnel costs as automation is expanded. The study also provides a wealth of management and planning information. The Iowa State focus on actual measurement of time spent at tasks over a multi-year period identifies both continuity and change in the amount of time spent on all activities. This perspective provides the opportunity to analyze the changes in tasks and the time spent on

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them as automation expands and improves. Because actual salaries can be assigned to the task times, cost analysis is also an ongoing result of the study. In this article, cataloging personnel time and costs are highlighted.

At the time of sample week sixteen, technical services at ISUL was divided into two departments, Cataloging and Acquisitions (see figure 1). There were 15.8 faculty, 1 professional and scientific position, 50 support staff, and about 370 hours of student assistants weekly. On the average, 3,100 hours (including paid leave) were worked weekly. The Cataloging Department was divided into three sections: Monographic Cataloging including pre-order searching, Serials Cataloging, and Catalog Management. Staff involved in Cataloging tasks include Library Assistants I, II, III, and IV and faculty catalogers. Student hourly employees work in various support activities.

TIME AND COST STUDY METHODOLOGY

TASK AND CENTER DEFINITIONS

To facilitate analysis of all technical services time, centers divided by tasks were established. All actual work is grouped into seven centers, and an eighth center, Leave, tracks sick leave, vacation, and holiday time. One hundred thirty total tasks are

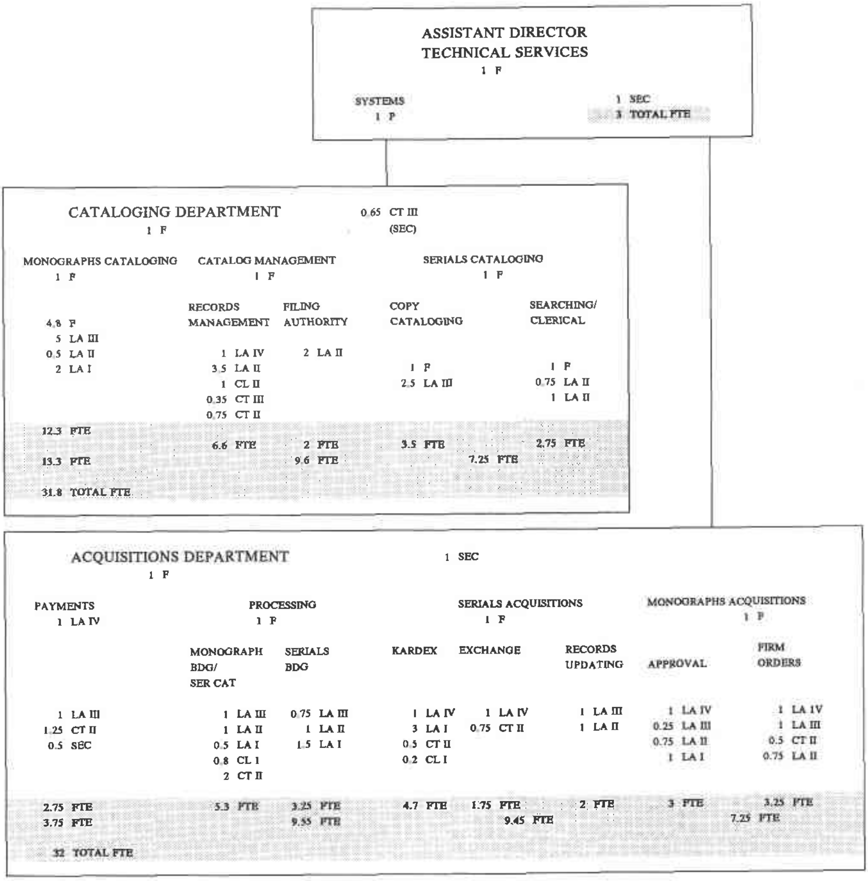

Figure 1. Iowa State University Library.

TABLE 1

TECHNICAL SERVICES CENTERS AND TASKS

Centers	Number of Tasks
Ordering/Receiving/Claiming	27
Cataloging	14
Volume Preparation	19
Catalog Maintenance	21
Automation	12
Conversion	14
Miscellaneous	20
Leave	3

divided among the centers as shown in table 1.

The time and cost study centers are defined as follows:

1. Ordering/Receiving/Claiming: Includes all the order, receiving, and claiming functions as well as the maintenance of associated files, but not the selection of materials.
2. Cataloging: Includes copy and original cataloging, searching for copy, authority work, recataloging, and internal file maintenance associated with all new title cataloging.
3. Volume preparation: Includes all functions associated with marking materials, binding, Tattle-Taping™, and minor in-house binding.
4. Catalog maintenance: Includes the activities involved in maintaining databases (public access catalog and serials catalog), card catalogs, and shelflists; making holdings and location changes; and entering cataloging completed off-line into the OCLC Online Computer Library Center's Online Union Catalog.
5. Automation: Tracks the impact of the introduction of personal computers, OCLC support, and the maintenance and troubleshooting of the library's turn-key online catalog.
6. Conversion: Covers a long-term retrospective bibliographic conversion project and will later be expanded to include other conversion activities such as authority and serials holdings records. It is important for management planning and assessment of costs to separate major projects having an end point from ongoing activities.
7. Miscellaneous: Includes all administration time, meeting attendance, nondivisional library and university work, professional service and research, and any other work time not associated with one center.
8. Leave: Vacation, sick leave, and holidays occurring during the sample week.

Cataloging as a center is separated from Catalog Maintenance in order to evaluate the time and costs of actual cataloging of material as opposed to that of keying records and the ongoing maintenance of catalogs. Catalog Maintenance includes the activities of card filing and maintenance, preparation of authority cards and references, adding inventory information to shelflist cards, maintenance of online records, cleanup of records, transfers, withdrawals, and inputting and editing of records cataloged off-line. The last activity includes entry of original records and limited editing of records in OCLC. (See appendix A for a summary of Catalog Maintenance tasks and times.)

Each center includes all the time associated with that activity except meetings. After review it was determined that few meetings relate to any one center and that it would be best to keep meeting time for all activities under the Miscellaneous center. Nearly every center contains the activities of training, documenting procedures and policies, consulting and referring, solving problems, sorting/shelving/distributing/receiving, revising, and other.

The 130 tasks are quite specific. Their definitions resulted from technical services-wide input and review. Specific tasks can be combined into more general ones. The task definitions are based on logical differentiation between work activities, identification of activities anticipated to change with automation, and uniform definition of tasks across centers to facilitate analysis on a wider basis. Revision and addition of tasks and expansion of definitions within centers occurred during the study period.

DATA COLLECTION AND SAMPLE PERIODS

The literature shows many approaches to gathering data for time and cost studies. Some studies use random sampling of work activities with an electronic random alarm mechanism. When the alarm sounds, the staff member records the time and the activity.[2] Another approach is through observation or employee recordings to time activities and count work completed with statistical adjustments made for nonworking time and staff absences.[3] At ISUL, after consultation with the university's statistical laboratory, it was decided to ask all staff daily to estimate time spent at tasks for a one-week period and to repeat the sampling over a multiyear period.

During the one-week sample period all technical services staff maintain records of total time worked. For two years samples were gathered every other month, but during the third year the collection periods were decreased from six to four times a year. The number of sample weeks was reduced to lessen the record-keeping burden for staff. Collection periods are staggered to allow sampling of first, second, third, and fourth weeks, and all months. Work patterns in technical services are fairly uniform throughout the year, but there is some variation between weeks of the month.

Time is recorded in increments of a quarter hour and is rounded to the nearest quarter of an hour. (For example, copy cataloging for 1 hour and 10 minutes would be recorded as 1.25 on a time sheet). Break time is not recorded; instead employees spread break time over the tasks worked. Staff members are asked to estimate daily the time spent at tasks. Some are very rigorous and keep track by the quarter hour of all time, and others wait until the end of the day and estimate task time. The number of tasks per position averages six and a half. These individual task times are added together to determine the time spent in each sample week on every task.

While testing has not been done to determine whether staff members have consistently recorded time, empirically the results show what is expected when the data are analyzed. For instance, in Serials Cataloging the amount of time for recataloging increased significantly during a week when the section was working heavily on recataloging titles because of a serials cancellation project. Again, in the Retrospective Conversion center we saw a significant increase in time during a period when we were finishing a grant-funded project and extra staffing was directed to the project.

SALARIES AND COSTS

For each sample week the exact annual salary with benefits is determined for all appointed staff. Benefits are 23.3 percent of the annual salary. Each salary is divided by 2,080 hours to arrive at an hourly salary. For student employees the actual hourly salary is recorded. No benefits are paid to students. Salaries change during a year because of raises and resignations. New employees, particularly support staff, normally begin at a lower salary than the individuals they replace.

For every staff member the total time spent at each task is multiplied by the staff member's hourly salary to compute the cost of that staff member doing a specific task. The cost of a task for a week is compiled by summing individual task costs.

Technical services faculty frequently work more than forty hours a week but are not reimbursed for this time. The time portion of the reports thus reflects this greater-than-forty-hour week. Since hourly salaries are computed for each staff member and the task time for each staff member is multiplied by the actual hourly salary, the costs reflect dollars the university did not pay. To adjust for these unreimbursed hours, records are kept of the faculty time worked over forty hours during a sample week. There is no way of knowing in what activities the time was spent. Consequently the inflated costs (those over forty hours) are removed across the board from all centers. They amount to 3 percent of all technical services costs.

POSITION NUMBERS AND COLLECTION OF DATA

Each staff member receives a position number reflecting the position's location in the organizational hierarchy. If a staff member works in more than one organizational unit, multiple position numbers are assigned. The position numbers are used to sort data by organizational level (department, section, and unit).

Records also contain an employment code for every position indicating whether the employee is classified as faculty (librarians), support staff, or student. It is not yet possible to sort the data by this code, but it will provide very useful management information about the levels of staff performing technical services activities and how this changes with automation.

The time studies are conducted anonymously. Supervisors normally have no access to individual time sheets, and no reports are produced from the study that would allow identification of staff. Considerable time was spent explaining to staff the purpose of the ongoing study and that data would never be used on an individual basis. Employees submit time sheets to the assistant director's secretary, who checks each for mathematical accuracy and any obvious errors and then enters the data.

Periodically, supervisors review time sheets to be certain no problems have arisen and to check for consistency in recording time, but these reviews are announced prior to the study period. Supervisory meetings then are held to review the accuracy of task definitions and to identify needed changes. Time sheets for new employees are reviewed by supervisors until the supervisor determines the staff member understands the process.

PRODUCTION UNITS FOR TIME AND COST ANALYSIS

It is very difficult to assess costs per item for a center because of the difficulty of determining production units. In catalog maintenance there are multiple production units: number of cards filed, number of cards changed, number of records changed, number of records entered, etc. No one production unit nor any combination of them provides a unit by which to measure costs for the center. Catalog Maintenance, while affected by the number of new items cataloged, is really an ongoing activity that occurs even without new additions. Volume preparation presents a similar problem.

Two activities that are reasonably measurable are cataloging and monographic ordering. However, order selection activities usually occur throughout a library, and technical services costs would only be a portion of the total costs of ordering. Cataloging, however, is performed almost exclusively in technical services and has clearly measurable production units.

Cataloging production units at ISUL are gathered monthly. For the purpose of cost determinations with the weekly time data, weekly production figures are extrapolated from these monthly figures. This process does result in misfits of production units to time in some weeks, but when averaged over a three-year period this evens out. For future time studies production data will be gathered for each study period and an analysis made of the results using the production units kept during the sample and those extrapolated for the week.

The cataloging production units are the *number of titles cataloged*, not the number of volumes handled. Thus costs reflected in this article are costs per title. If the number of volumes were used as the production unit, the costs per volume would, of course, be lower than the costs per title.

Three types of quantifiable cataloging production records are kept for both serials and monographs: copy cataloging, original cataloging, and recataloging. Together they represent the total cataloging production. In analyzing costs per title in this article two figures are generally given. One includes recataloged titles, which results in higher production units and thus lower costs. The other excludes recataloging and results in a higher bottom-line cost. In analyzing cataloging costs for technical services, it is important to include recataloging production units because of the high percentage of recataloging involved in serials cataloging.

SOFTWARE

All data are sorted and analyzed using *Lotus 1-2-3*, release 2.2. Rate files exist to maintain salary data by position numbers and to calculate hourly salaries. Only changes to salaries between sample weeks subsequently are entered. Data files were written to enter position numbers, task numbers, and times for each sample week. These files also pull the hourly salary from the rate file and calculate the task costs for each position. Other macros allow the sorting of data by position number and the adding of task time and costs. Spreadsheet macros pull together results for the entire study, complete various calculations, and display the results in varying formats.

RESULTS

CENTER TIMES AND COSTS

The Ordering/Receiving/Claiming center, with twenty-seven tasks, is the largest center in technical services (see table 2). In hours it represents 25.72 percent of all technical services time. Costs are presented with and without overhead. Overhead is the technical services time spent in miscellaneous tasks as well as all leave time, which added together totals 30 percent of technical services time. With overhead included, Ordering has the highest costs at nearly 37 percent of total technical services costs. These percentages represent technical services averages over the course of the three-year study.

While there is variation from sample week to sample week in actual percentages, the center rankings never varied. Leave showed understandably the greatest variation over the sample weeks. One holiday occurred during sample week nine.

In the Cataloging center there are fourteen tasks (for definitions see appendix B). Table 3 ranks each task in descending order according to the sixteen-week average of the hours devoted to each task. Similar averages are given for the percentage of time and cost for each task within the center. The average hourly salary for each of the fourteen Cataloging tasks represents the average weekly time for each task divided by the average weekly cost of the task. Table 4 shows the variation in time spent at tasks over the course of the study.

TABLE 2

TECHNICAL SERVICES CENTER PERCENTAGES

Center	Time (%)	Std. Dev. (%)	Avg. Weekly Hours	Costs Overhead (%)	
				Without	With
Ordering	25.72	2.37	798	22.34	36.90
Cataloging	16.65	2.40	517	18.12	29.93
Cat. Maintenance	12.01	1.78	376	8.21	13.57
Volume Prep.	9.54	1.40	296	6.63	10.95
Conversion	4.70	1.51	146	3.80	6.28
Automation	1.03	.48	32	1.43	2.36
Miscellaneous	19.41	3.10	602	27.12	
Leave	10.83	5.38	336	12.35	
Total			3,103		
FTE Equivalent			77.6		

Overhead is the Costs from the Miscellaneous and Leave Centers.
Average Weekly Hours includes unreimbursed overtime by faculty, which is removed when calculating costs.

TABLE 3

WEEKLY AVERAGES FOR CATALOGING TASKS

Task	Percent		Hours	Hourly Salary
	Time	Cost		
Copy Cataloging	35.5	37.9	184	$13.83
Recataloging	17.6	17.8	91	13.14
Authority Work	13.9	9.0	69	8.25
Original Cataloging	9.7	10.8	48	14.78
Sorting, Shelving, Etc.	5.5	4.8	28	11.39
Consulting & Referring	4.2	5.6	22	17.36
Searching for Copy	3.4	2.5	17	9.96
Training (Trainer)	2.7	3.5	15	16.95
Revision	2.5	2.8	13	14.31
Training (Trainee)	1.2	1.2	13	12.33
Procedure & Policy	1.2	1.3	6	14.58
Solving Problems	.9	1.2	5	17.12
Other	.8	.8	5	12.44
File Maintenance	.8	.6	4	8.95
Total Weekly Average			520	13.24
Average Weekly Cost	$6,884.80 (without overhead)			

CATALOGING TASKS

COPY, RECATALOGING AND ORIGINAL CATALOGING

Copy cataloging accounts for 35.5 percent of the cataloging center time and includes all cataloging with copy: OCLC member records, Cataloging In Publication (CIP), or full Library of Congress (LC) records. ISUL catalogs more than 90 percent of all new monographic titles at receipt with copy found in the OCLC database. Most copy cataloging is done online at the time of receipt and thus includes OCLC editing and transmittal times. Titles not cataloged at receipt are held a maximum of six months, and if at the end of this period there is no cataloging copy in OCLC, they are originally cataloged. The percentage of time spent at this task was remarkably stable throughout the study.

Recataloging includes serial title and corporate author changes as well as other significant serial and monographic cataloging changes. It also includes adding subsequent copies to bibliographic records and adding volumes to multivolume sets. The latter can include additions of editors and contents information as well as changes in edition statements. At 17.6 percent (time) and 17.8 percent (cost), recataloging is the second-highest Cataloging center task. The percentage of time across the study fluctuated more than that for copy cataloging.

Original cataloging is all cataloging for which ISUL creates a bibliographic record and accounts for only 6 percent of all cataloging of monographs and serials, 9.7 percent of the center time, and 10.8 percent of the cost. The percentage of time devoted to original cataloging dropped during the study. ISUL has three levels of original cataloging:

Full records added to OCLC (36 percent of all original cataloging).

ISU thesis records added to OCLC with local subject headings and no classification numbers (39 percent of all original cataloging).

Minimal-level records (normally

TABLE 4

CATALOGING HOURS PER WEEK: ANNUAL AVERAGES

	1987		1988		1989		1990*	
Weeks Sampled	5		5		5		2	
Tasks	%	Hours	%	Hours	%	Hours	%	Hours
Copy Cataloging	36.9	197.7	34.1	151.2	35.2	197.1	36.2	196.8
Recataloging	15.2	81.4	21.8	97.3	17.4	95.8	15.8	85.5
Authority Work	12.3	66.9	10.8	47.1	16.0	93.5	20.6	112.0
Original Cataloging	12.7	68.3	10.6	48.7	6.4	35.5	7.6	41.1
Sorting/Distribution	6.2	33.5	5.8	24.9	5.0	28.1	4.0	21.6
Consulting	3.9	20.9	4.8	21.5	4.0	22.0	4.2	22.7
Training	1.2	6.4	2.7	13.1	7.7	42.2	3.6	20.0
Miscellaneous Total	11.6	62.3	9.4	42.2	8.2	46.1	7.9	43.2
Total	100.0	537.4	100.0	446.0†	99.9	560.3	99.9	542.9
Miscellaneous								
Copy Searching	4.7	25.2	3.4	15.0	2.7	14.5	1.3	7.0
Revision	2.8	15.5	2.5	11.3	2.2	12.8	3.2	17.4
Problem Solving	1.2	6.4	.9	4.0	.5	3.2	.8	4.4
Other	1.1	5.7	.9	4.0	.5	3.1	.3	1.8
File maintenance	1.1	5.7	.9	4.0	.5	3.2	.5	2.7
Procedure/Policy	.7	3.8	.8	3.9	1.8	9.3	1.8	9.9

Rounding causes some totals to be less than 100%.
*Unlike earlier tables, this includes a seventeenth week.
†Reduction represents significant vacancies in 3 positions during the year.

author-title analytics for analyzed serials) entered only in the local database. They are assigned no subject headings and carry the call number of the serial (25 percent of all original cataloging).

The staffing levels participating in the three types of cataloging and the average hourly salary for each are given in table 5. The average hourly salary for original cataloging is not much greater than that for other cataloging.

AUTHORITY WORK

Authority work is recorded as a separate task only when it is performed as such. This normally occurs when conflicts are found in the databases and during new record entry, as well as because of announced changes to the *Library of Congress Subject Headings*. Authority work represents 13.9 percent of the Cataloging center's time but only 9 percent of the cost, reflecting the

TABLE 5

AVERAGE HOURLY SALARIES FOR CATALOGING

Type	Copy	Original	Recataloging
Staffing Levels	LA III & IV Faculty	LA I–IV Faculty	LA II–IV Faculty
Average	$13.83	$14.78	$13.14
Range	($11.93–$15.33)	($12.43–$17.21)	($11.17–$15.47)
Std. Dev.	$0.95	$2.13	$1.15

lower salaries paid to student employees involved in checking headings. The average salary is $8.25 per hour (including benefits for appointed staff), representing the lowest hourly salary in the Cataloging center.

Over the three-year period authority work increased by about 70 percent (see table 4) and saw an increase in cost of nearly 75 percent. In dollars this represented an increase of more than $400 per week. ISUL does not have an online authority control system with its online public access catalog, but authority control must be maintained for the online database. With a card catalog–based authority control system, authority conflicts not detected by catalogers were found during card filing, whereas with the online catalog, all headings are checked against online files. In addition, the precision of online catalog searching creates even greater demands for accuracy within indexed fields. During the same time the number of headings changed by LC also increased. For ISUL this entailed increased staff time devoted to authority control and increased authority work backlogs.

SORTING AND DISTRIBUTING

Sorting, shelving, and distributing materials for cataloging represent the fifth-largest task, but the time spent at the task dropped over the three-year period.

CONSULTING

Consulting and referring on cataloging problems remained fairly constant over the duration of the study. In time it is the sixth-largest task (twenty-two hours per week), but in cost it is the fifth, representing the highest hourly average salary in the cataloging center.

TRAINING

Training accounts for 3.9 percent of the Cataloging center time and 4.7 percent of the cost. It is counted in two tasks, as shown in table 6. If the employee is not performing a task resulting in actual work accomplished but is, for example, reading a manual or following a tutorial, the time is counted as training (trainee). Training (trainer) is the time spent actually teaching and revising during training. When an employee is in training and is performing a task, the time is not counted as training but rather is included in the time for the task itself.

Thus the training tasks combined are the seventh-largest cataloging activity. Furthermore, during the three-year period training time increased more than threefold. At the beginning of the study an average of 6.4 hours per week was spent in training tasks; this average later jumped to 42.2 hours and most recently was twenty hours. The average hourly salary for a trainer is the third-highest ($16.95 per hour) in the center.

OTHER CATALOGING TASKS

The remaining six tasks (copy searching, revision, problem solving, other, file maintenance, procedure/policy) account for 9.6 percent of the center time and 9.2 percent of the costs. (For descriptions of these tasks see appendix B.)

Searching for copy represents 3.4 percent of time and 2.5 percent of cost. Over the three years there was a significant drop in the searching time. The average in 1987 was more than twenty-five hours per week, but by 1990 it had dropped to seven hours.

CATALOGING TIMES PER TITLE

If all the time for the entire Cataloging center, including both serials and monographic cataloging, is divided by the number of new titles cataloged, the ISUL data show that cataloging takes an hour per title. If recataloging production units are

TABLE 6

CATALOGING TRAINING WEEKLY AVERAGES

Tasks	Center Percentages		Hours
	Time (%)	Cost (%)	
Training (Trainer)	2.7	3.5	15
Training (Trainee)	1.2	1.2	13
Totals	3.9	4.7	28

included, the time drops to three quarters of an hour per title. (See appendix C for the cataloging center time data for all sixteen sample weeks.) These figures include the time devoted to actual cataloging as well as the time spent in training, procedure and policy documentation, sorting and distributing work, consulting, problem solving, authority work, and copy searching.

If only the task of copy cataloging is analyzed, nearly three titles are cataloged on an average per hour. This includes both serials and monographs and all types of copy including full LC, CIP records, full OCLC member records, minimal-level records, and records from other national libraries and associated authority work. Because the majority of copy cataloging is done online, the task includes copy searching and online editing times. Because ISUL accepts LC call numbers, copy cataloging requires little time for call number verification.

Original cataloging takes an average of nearly one and one-half hours per title, but this is misleading because it includes local minimal-level records and simplified ISU thesis cataloging. Future research will separate out full-level original cataloging. Again, this figure includes authority work and covers both serials and monographs.

Recataloging takes slightly less than one hour per title including any authority work. Recataloging covers serial and monographic recataloging as well as adding additional copies and volumes to a monographic title or set as explained earlier.

CATALOGING COSTS PER TITLE

The overhead added to all costs includes vacation, holiday, and sick leave pay occurring during the sample weeks. Also included is the entire Miscellaneous center, which covers all administrative overhead; all nondivisional activities (e.g., staff association work and university committee work); travel time to professional meetings; and all faculty research, scholarship, and service activities.

Copy cataloging accounts for the greatest portion (37.8 percent) of the Cataloging center costs. As shown in table 7, the cataloging cost per new title is $20.01, averaged over the sixteen sample weeks from 1987 to 1990. If recataloging titles are added to the production unit, then the bottom-line cost drops to $16.53 per title. Included in these figures is the entire cost of the Cataloging center (authority work, training, copy searching, etc.) and overhead. The average hourly salary of the cataloging center rose nearly 25 percent over the three-year study from $11.52 to $14.35.

Costs for copy cataloging, original cataloging, and recataloging as separate tasks are also given in table 7. However, they are the costs of the task only and do not include any of the associated costs of training, procedure and policy documentation, revision, or separate authority work activity. They do include overhead.

ANALYSIS

It was surprising to find that recataloging is the second-largest cataloging task. It is the seventh-largest task in technical services, after administration, cataloging with copy, vacation, receiving materials, meetings, and sick leave. It is a significant cost in maintaining the integrity of a catalog. It also shows that for the determination of cataloging costs, recataloging is a very important production unit.

Another startling result was the slight variation in average hourly salary for copy and original cataloging. This illuminated a flaw in the task definitions. The results show that it is necessary to define more narrowly the original cataloging task by removing thesis cataloging and minimal-level cataloging to a separate task. They also reflect the participation of faculty catalogers in copy cataloging. They handle certain complex copy cataloging lacking classification numbers and subject headings.

The alarming increase in authority control costs demonstrates the need for effective authority control systems, but the market is sadly lacking. Sarah Hager Johnston compared eighteen vendors of automated library systems. Her survey identified the functions and capabilities necessary for automated authority control. She found that nearly every capability was available from

TABLE 7

CATALOGING COSTS PER TITLE WITH OVERHEAD

Years	Copy*	Original*	Recataloging*	All Cataloging†	
				With Recat	Excluding Recat
1987–90	$8.18	$34.13	$18.93	$16.53	$20.01
1987/88	7.74	33.71	19.05	16.11	19.01
1988/89	8.24	33.34	25.52	17.43	20.56
1989/90	9.02	32.99	11.42††	16.72	21.57

*Includes only the costs associated with the task.
†Includes the costs of the entire Cataloging Center.
‡Lower costs due to increased productivity.

at least one vendor, demonstrating that the appropriate technology is available. However, she found that the technology is highly underutilized, with essential capabilities being offered by only 65 percent of the surveyed systems. She believes that neither librarians nor vendors have paid enough attention to authority control.[4]

The growth of training time and its cost demonstrate the impact of turnover, new procedures and policies, and changing technology. The training function for cataloging is equivalent every week to one three-quarter-time staff member's time out of the equivalent of thirteen full-time staff, and this does not take into account the slower productivity that results during training. Further monitoring of this dramatic increase in training time is required to shed light on the impact of technological change on training costs. These results demonstrate the need to investigate computer-assisted training to determine whether it can reduce the costs and improve or maintain the current quality of cataloging training.

The searching task is somewhat misleading. At ISUL a large percentage of cataloging is done online at receipt, and much copy searching time is actually part of the copy cataloging task. In addition, a large amount of copy is found during preorder searching and thus appears in another center. The searching task greatly reflects the time spent re-searching for titles not cataloged at receipt. The significant drop in the searching time correlates with the reduction in the size of the cataloging backlog. The average in 1987 was more than twenty-five hours per week, but by 1990 it dropped to seven hours. More than $70 per week was saved. This demonstrates one of the costs of a cataloging backlog. Another example of the cost impact of a reduced cataloging backlog is the time spent maintaining records for material being processed. In 1987 nearly six hours were spent per week; by 1990 the time dropped to under three hours. While these are rather insignificant times, they still reflect a change that is worth noting.

The time and cost study covers a three-year period, and the salaries and costs per title are averaged over this period. The costs cited in the text reflect this three-year average; however, some tables show the cost in each of the three years. While cataloging costs rose over the three-year period, the time of cataloging per title remained fairly constant.[5]

CONCLUSION

The time and cost study provides the Iowa State University Library with very valuable information on the use of time in the technical services division. It was important to document that Ordering/Receiving/Claiming was a significantly larger center than Cataloging. In terms of planning and projecting technical services staffing needs in an environment of reduced receipts, it is important to know that Catalog Maintenance as a separate activity accounts for 12 percent of technical services time, because it is an ongoing activity separate from actual new title cataloging. In the same vein it is vital to know that recataloging is the seventh-largest task in the division. In terms of projecting productivity it is helpful to know that Leave (vacation, sick leave, and holidays) represents nearly another 11 percent of total time.

Management now knows the costs of cataloging new material and can further break them down to serial and monographic costs. We know that the time devoted to the Cataloging center remained fairly constant over the three years but that the time distribution within the center changed. Copy cataloging stayed remarkably consistent. While recataloging fluctuated, its time increased only slightly. Original cataloging time dropped significantly as did the time devoted to miscellaneous cataloging tasks, while authority control and training saw even greater increases.

Certainly the costs identified emphasize the need for a higher priority for automated authority control. ISUL will be introducing online authority control in the near future, and it will be possible to track the impact in terms of time and costs.

The cost of in-house retrospective conversion is clearly determinable. The study data have been used to evaluate whether to use a vendor or do conversion in-house. The retrospective conversion and copy cataloging costs also were used in preparing a statewide grant request.

During reorganizations the task times were used to shift staff and responsibilities more fairly. In planning for further automation, we know the staff time spent at manual activities and can project personnel needs and reallocation of human resources. Also, in planning special projects the time data have allowed more certain estimates of staffing needs.

To make the data more meaningful to the profession requires replication at other institutions using similar methods and definitions. Attempts to compare the ISUL data to other institutions' data proved futile because of the differing definitions and methods used. Deborah A. Tavenner substantiates this problem in her annotated bibliography of cataloging cost studies.[6] In Paul Kantor's study of unit costs of some technical processes in eight libraries it is noted that the "value of detailed cost analysis is enormously enhanced when several libraries adopt the same analytic techniques. The results become truly comparable, permitting the determination of representative value and ranges of variation."[7]

The longitudinal study on the impact of automation on ISUL technical services is under way and will require several more years before substantial data are available. At this point the impact of automation on authority control clearly shows a dramatic increase in time and costs, and the data suggest a similar impact on training time.

Conducting a time and cost study of this magnitude requires a serious administrative commitment as well as understanding and cooperation on the part of the staff involved. Institutions interested in replicating this study must be able and willing to allocate staff time to perform and administer it. With this research it is possible to understand more clearly where technical services costs originate and to provide another perspective from which to review and improve services. The emphasis on a time study rather than costs makes the information more meaningful for inter-institutional comparisons.

REFERENCES AND NOTES

1. Malcolm Getz and Doug Phelps, "Labor Costs in the Technical Operation of Three Research Libraries," *Journal of Academic Librarianship* 10:209 (1984).
2. J. L. Divilbiss and Phyllis C. Self, "Work Analysis by Random Sampling," in *Costing and the Economics of Library and Information Services*, ed. Stephen A. Roberts, ASLIB Reader Series v.5 (London: Aslib, 1984), p.77–81.
3. D. H. Revill, "Unit Times in Studies of Academic Library Operations" in *Costing and the Economics of Library and Information Services*, p.184–201.
4. Sarah Hager Johnston, "Desperately Seeking Authority Control; Automated Systems Are Not Providing It," *Library Journal* 115:43–46 (Oct. 1, 1990).
5. For a discussion of ISUL serial cataloging costs and a comparison with monographic cataloging costs see the forthcoming article by Lori L. Osmus and Dilys E. Morris, "Serials Cataloging Time and Costs: Results of an Ongoing Study at Iowa State University," *The Serials Librarian* 22, no.1/2 (1992).

6. Deborah A. Tavenner, "Cataloging Cost Studies," in *Library Hi Tech Bibliography*, v.3, ed. C. Edward Wall (Ann Arbor, Mich.: Pierian Pr., 1988), p.23–30.
7. Paul B. Kantor, "Three Studies of the Economics of Academic Libraries," in *Advances in Library Administration and Organization; A Research Annual* 5, ed. Gerard B. McCabe and Bernard Kreissman (Greenwich, Conn.: JAI Press Inc., 1986), p.222.

APPENDIX A

Catalog Maintenance	Weekly Averages			
	Time		Cost	
Definitions	Percent	Hours	Cost	Per Hour
Training (Trainer)	3.22	12.09	$ 148.32	$12.26
Procedure & Policy Formulation	0.19	0.70	9.75	13.87
Consulting & Referring	0.90	3.39	48.56	14.32
Solving Problems	1.72	6.45	84.37	13.07
Catalog Card Receiving	3.78	14.22	110.09	7.74
Catalog Card Filing	21.27	80.02	355.31	4.44
Catalog Card Filing Revision	6.21	23.34	243.22	10.42
Pulling Catalog Cards	5.67	21.31	94.96	4.46
Catalog Card Changes	4.16	15.64	74.75	4.78
Authority/Reference Card Creation	1.62	6.09	41.32	6.78
OCLC Editing/Inputting	11.20	42.14	399.28	9.47
Serials Catalog Editing/Inputting	2.11	7.92	73.45	9.27
OPAC Editing/Inputting	4.99	18.78	235.49	12.54
Adding Holdings to Shelf List	7.55	28.41	121.36	4.27
Serials Catalog Sequencing	1.15	4.34	50.40	11.60
Serials Catalog Distribution	0.29	1.08	9.76	9.06
OPAC Clean-up	3.66	13.75	140.60	10.23
Holdings/Location Changes	7.73	29.08	266.11	9.15
Revision	9.87	37.11	447.35	12.05
Other	2.16	8.11	51.19	6.31
Training (Trainee)	0.58	2.17	7.77	3.58
Average Weekly Totals		376.14	3,013.41	8.01

APPENDIX B

CATALOGING CENTER TASKS AND DEFINITIONS

CA01. Training (trainer)
Used only by individuals training others.

CA02. Procedures and policy documentation.

CA03. Consulting and referring/responding to inquiries associated with cost center.
Includes CDC work, giving demonstrations/presentations, filling out questionnaires, requests for review of cataloging, in-process requests.

CA04. Solving problems.
Resolving (or working on) problems which fall out of normal procedures and cannot be handled following the usual guidelines. Often work falling into this category is referred because an individual did not know how to proceed. Problem solving does not refer to complex investigation/verification, etc. which is part of an assigned task.

CA05. Sorting, shelving, distributing, and retrieving.
Handling of any material prior to or immediately after cataloging; also includes sequencing of volumes for Holding cage. Sorting Cat As.

CA06. Searching for cataloging copy. (Use only if performed as separate task, otherwise count as type of cataloging.)
Includes printing.

CA07. Maintaining Unit/Holding Files.
Includes pre-cataloging filing and recording of accession numbers in the on-order file.

CA08. Cataloging with copy.
Includes assigning classification numbers.

CA09. Original cataloging.
Includes full level original cataloging and minimal level original cataloging.

CA10. Recataloging.
Cessations, title changes, library has closings, notes, reclassifications, entry changes, added copies/volumes, retention changes; as well as withdrawals and transfers only when other recataloging is involved.

CA11. Authority work. (Use only if performed as separate task, otherwise count as type of cataloging.)
Includes searching, verifying, resolving, printing.

CA12. Revision.
Includes all reviewing of others' work, but does not include training staff in new tasks.

CA13. Other.

CA14. Training (trainee only).
Used by individual being trained *only* if no work is accomplished during training; such as programmed learning tutorials, reading manuals.

APPENDIX C

CATALOGING TASKS AND TIMES

Definitions	Task Nos.	Avg. No. 2+	Std. Dev.	1987			
				Apr. 5–11 No. 1	June 7–17 No. 2	Aug. 16–22 No. 3	Oct. 25–31 No. 4
Training (trainer)	1	15.27	11.16	0.25	2.00	16.75	5.75
Procedure & policy	2	5.62	6.78	12.25	1.50	1.75	3.25
Consulting	3	21.68	3.80	21.50	21.25	22.00	14.50
Solving problems	4	4.32	2.75	7.25	11.25	5.25	4.50
Sorting, shelving, dist.	5	27.90	7.21	35.00	42.50	31.25	27.50
Searching copy	6	16.55	7.04	31.50	19.00	23.25	24.75
Unit/hold. file main.	7	4.02	1.78	6.50	8.50	4.75	2.00
Copy cataloging	8	184.18	30.25	173.00	216.50	196.00	217.50
Original cataloging	9	48.20	20.46	79.25	47.75	77.50	82.00
Recataloging	10	91.22	14.81	83.00	65.00	97.50	76.75
Authority work	11	69.48	37.42	108.00	75.00	51.75	47.75
Revision	12	12.55	5.83	24.75	13.50	19.50	15.00
Other	13	4.48	3.37	0.75	0.00	12.25	5.50
Training (trainee)	14	6.75	11.94	0.00	0.00	0.00	0.00
Working days				22	22	21	22
Monthly cataloging							
Copy		2,126.13	316.22	2,068.00	2,645.00	2,412.00	2,395.00
Original		152.13	62.66	44.00	82.00	255.00	240.00
Recat		477.27	161.30	481.00	557.00	340.00	404.00
Avg. weekly cataloging		651.25	119.04	589.32	746.36	715.95	690.68
Copy		502.18	65.31	470.00	601.14	574.29	544.32
Original		36.08	15.12	10.00	18.64	60.71	54.55
Recat		112.99	38.61	109.32	126.59	80.95	91.82
Each task only: time/title							
Copy		0.37	0.05	0.37	0.36	0.34	0.40
Original		1.44	0.54	7.93	2.56	1.28	1.50
Recat		0.91	0.37	0.76	0.51	1.20	0.84
All tasks: time/title							
With recat		0.79	0.08	0.99	0.70	0.78	0.76
Without recat		0.96	0.12	1.21	0.85	0.88	0.88
Total		512.22		583.00	523.75	559.50	526.75
% of TS time		16.42		18.32	16.55	18.08	16.20

APPENDIX C CONTINUED

CATALOGING TASKS AND TIMES

1987 continued	1988					1989	
Dec. 6–12 No. 5	Feb. 410 No. 6	May 15–21 No. 7	July 24–30 No. 8	Sept. 4–10 No. 9	Nov. 13–19 No. 10	Jan. 15–21 No. 11	Mar. 26–Apr. 1 No. 12
7.50	15.75	14.25	1.00	16.50	6.50	1.25	33.50
0.50	2.50	8.00	9.00	0.00	0.25	23.50	17.00
25.25	25.50	21.00	24.75	12.50	24.00	23.00	18.50
3.75	4.00	6.25	2.75	5.75	1.25	5.00	5.50
31.25	29.75	20.50	25.50	30.75	18.00	21.00	28.75
27.50	22.75	11.25	7.25	11.25	22.50	15.25	24.50
6.75	5.25	3.25	4.25	4.75	1.25	3.00	2.75
185.50	166.00	158.25	169.50	116.25	146.00	174.50	171.00
55.25	86.50	64.50	25.75	35.50	31.50	19.50	55.50
85.00	110.50	103.50	101.50	65.25	106.00	113.75	91.75
52.25	37.50	59.50	42.50	42.50	53.50	40.00	37.75
5.00	12.75	17.00	16.25	4.75	6.00	6.25	4.00
10.25	5.50	6.75	5.00	0.25	4.00	3.00	2.50
0.00	1.00	0.00	0.00	0.00	3.50	45.00	24.25
21	22	20	21	20	20	21	23
1,881.00	1,881.00	2,021.00	1,662.00	1,689.00	1,645.00	2,485.00	2,268.00
214.00	169.00	203.00	98.00	227.00	54.00	60.00	142.00
366.00	526.00	474.00	331.00	350.00	260.00	304.00	396.00
585.95	585.45	674.50	497.86	566.50	489.75	678.33	610.00
447.86	427.50	505.25	395.71	422.25	411.25	591.67	493.04
50.95	38.41	50.75	23.33	56.75	13.50	14.29	30.87
87.14	119.55	118.50	78.81	87.50	65.00	72.38	86.09
0.41	0.39	0.31	0.43	0.28	0.36	0.29	0.35
1.08	2.25	1.27	1.10	0.63	2.33	1.37	1.80
0.98	0.92	0.87	1.29	0.75	1.63	1.57	1.07
0.85	0.90	0.73	0.87	0.61	0.87	0.73	0.85
0.99	1.13	0.89	1.04	0.72	1.00	0.82	0.99
495.75	525.25	494.00	435.00	346.00	424.25	494.00	517.25
15.67	16.32	15.86	13.51	10.23	14.37	17.33	16.57

Appendix C Continued

Cataloging Tasks and Times

				1989 continued			1990
Definitions	Task Nos.	Avg. No. 2+	Std. Dev.	May 7–13 No. 13	July 9–15 No. 14	Sept. 17–23 No. 15	Mar. 26Apr. 1 No. 16
Training (trainer)	1	15.27	11.16	18.00	32.50	34.00	23.75
Procedure & policy	2	5.62	6.78	0.25	5.75	0.00	11.00
Consulting	3	21.68	3.80	25.25	20.00	23.25	24.50
Solving problems	4	4.32	2.75	1.00	0.00	1.50	7.00
Sorting, shelving, dist.	5	27.90	7.21	25.75	22.00	43.25	20.75
Searching copy	6	16.55	7.04	7.25	12.75	13.00	6.00
Unit/hold. file main.	7	4.02	1.78	3.25	4.25	2.75	3.50
Copy cataloging	8	184.18	30.25	217.25	231.75	190.75	206.00
Original cataloging	9	48.20	20.46	34.50	34.75	33.25	39.25
Recataloging	10	91.22	14.81	99.50	85.25	89.00	78.00
Authority work	11	69.48	37.42	92.25	159.75	135.75	112.50
Revision	12	12.55	5.83	18.00	23.25	12.75	14.25
Other	13	4.48	3.37	1.25	6.50	2.50	2.00
Training (trainee)	14	6.75	11.94	9.00	7.00	6.50	5.00
Working days				22	20	20	22
Monthly cataloging							
Copy		2,126.13	316.22	2,350.00	2,144.00	1,989.00	2,425.00
Original		152.13	62.66	124.00	116.00	156.00	142.00
Recat		477.27	161.30	681.00	710.00	723.00	737.00
Avg. weekly cataloging		651.25	119.04	717.05	742.50	717.00	750.91
Copy		502.18	65.31	534.09	536.00	497.25	551.14
Original		36.08	15.12	28.18	29.00	39.00	32.27
Recat		112.99	38.61	154.77	177.50	180.75	167.50
Each task only: time/title							
Copy		0.37	0.05	0.41	0.43	0.38	0.37
Original		1.44	0.54	1.22	1.20	0.85	1.22
Recat		0.91	0.37	0.64	0.48	0.49	0.47
All tasks: time/title							
With recat		0.79	0.08	0.77	0.87	0.82	0.74
Without recat		0.96	0.12	0.98	1.14	1.10	0.95
Total		512.22		552.50	645.50	590.25	553.50
% of TS time		16.42		17.49	20.33	19.90	17.94

Automated Workstations for Professional Catalogers: A Survey of 100 Non-ARL Academic Libraries

Betsy N. Hine

A survey of 100 academic libraries that were not members of the Association of Research Libraries was conducted in the fall of 1989 to determine how many libraries had, or soon would have, individual automated workstations for their professional catalogers. The number of libraries expecting to acquire these workstations at some future time was also determined. Also investigated were: (1) costs and types of equipment being used or considered, (2) current and projected uses of automated workstations, and (3) workstations' impact on cataloger productivity, processing costs, and the quality of catalog records.

Since the introduction of online bibliographic utilities, much has changed about the way libraries use machines in cataloging. It is taken for granted now that machines for accessing a bibliographic utility at the local library are only part of the library's total automation. Local systems, networks, and even second local systems in several cases are the tools necessary for library automation.

Bibliographic network terminals were once the only signs of library automation in a cataloging department. Not only have those machines changed dramatically, but the microcomputer and printer have become as commonplace as the manual typewriters and electric erasers of old. The concept of automation and all of its ramifications are firmly in place. Workflow, ergonomics, and the stress of working at terminals for prolonged periods are concerns of all. Flexibility and adapting to change are buzzwords in an area that remained virtually unchanged for almost a century.

In 1989 Sally Rogers published "Automated Workstations for Professional Catalogers: A Survey of ARL Libraries." Rogers surveyed the 118 members of the Association of Research Libraries (ARL) in the United States and Canada.[1] This paper is a report of a replication of Rogers' study, in which medium-sized academic libraries were surveyed to ascertain their progress in the use of automated workstations and to compare it with that of the larger research libraries.

For the purposes of this study, the term

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workstation refers to a terminal or microcomputer with peripherals attached for the use of an individual cataloger. This definition may be seen as being in opposition to the concept of those terminals, usually found in public areas, that are designed for use by many people. It is assumed that the use of workstations in production areas of libraries is beneficial and has a positive effect on productivity as well as the quality of work. It is also assumed that such positive effects are essential in these days of budget problems and staff cuts, which necessitate greater efficiency than ever before.

The main objective of this study was to examine non-ARL academic libraries to find out which have already provided, or expect to provide in the near future, automated workstations for their professional catalogers and to attempt to ascertain some expected and actual effects of automation efforts. Another objective was to learn whether some libraries intend to provide such automated workstations at some future time not yet determined. This study also represents an attempt to replicate the original purpose and goals of the Rogers study and to present comparisons between the two.

A year and a half after Rogers' study, little has appeared in the library literature concerning original catalogers and automated workstations. An article by Diane Vizine-Goetz listed "designing a cataloger's workstation" as a topic for research identified at the November 1988 conference on "Classification Theory in the Computer Age."[2] If electronic mail messages are any indication of interest in this topic, one can certainly say that libraries are anxious to explore and provide, insofar as it is possible, some sort of automated workstation that can provide catalogers access to many bibliographic databases and cataloging tools. Products such as personal computers (PCs) to access utilities and local systems, CD-ROM databases, and miscellaneous online products that could be used by catalogers are abundant. While accessing all of these easily from one station is the ideal, adding access incrementally is probably more realistic. Using PCs to create workforms, as Randall Scott has described,[3] is an intermediary step to actually creating records online and passing them electronically, instead of on paper work slips, to the next processing unit and into the system itself.

Some of the available literature discusses automation and its effects on cataloging staff, but there is little to be found on providing automated workstations for professional catalogers in a technical services area of an academic library. Blaine Morrow has described a cataloging product called SuperCAT,[4] which provides access to the Library of Congress (LC) MARC record database only. Records can be created and edited on the workstation, but it is intended to be a stand-alone cataloging workcenter, not integrated with any system or other database. The workstation of the future might be able to access the same LC database but on a PC that is also able to access the LC authority files, the local system, the statewide or regional network, cataloging rules and interpretations, classification schedules, and local in-house files.

There have been articles on workstations (but usually in public-service areas), on automation in libraries, and on automation's effects on staffing issues in technical services (cross-training, effects of staff reductions on productivity, etc.), but as Rogers also found, there is little specifically on the topic described here.[5]

THE HYPOTHESIS

Rogers hypothesized that at the time of her study (spring 1988), there were fewer than 10% of ARL libraries that had terminals or microcomputers at their professional catalogers' desks, while the majority were expecting to have such equipment at some future time. The hypothesis for the replication was that a larger percentage of non-ARL libraries had terminals or microcomputers at catalogers' desks, and that a larger majority were planning for such equipment in the near future.

It was suspected that the smaller libraries might have found it easier to provide automated workstations because there were fewer staff to buy for and therefore automation might be somewhat more manageable when the collections and staff were not as large as in the ARL study. I also suspected, as Rogers did, that cost would be the primary reason for not providing automated workstations for professionals. A central assumption in both studies was that the expense of providing these workstations would have to be justified by increased productivity, higher quality of work, and reduced processing costs.

DATA-COLLECTION METHODS

The institutions included in the *ACRL University Library Statistics, 1987-1988: A Compilation of Statistics from One Hundred Non-ARL University Libraries* constituted the population under study.[6] Only the names of the institutions and the collection sizes from this list were used. The other statistical information contained in it was disregarded. The current *American Library Directory* was checked for the institutions' mailing addresses and the names and telephone numbers of heads of cataloging, or the equivalent, as contact persons. The survey had two stages: first, a telephone interview, and second, a follow-up questionnaire mailed to each contact person. Each person on the list was contacted by telephone during October and November 1989. During the telephone interview, each contact was asked to verify the name of the contact and the title of the position, the address of the institution, and the cataloging utility used. The number of professional catalogers was ascertained, and each contact was asked whether professional catalogers had computer terminals or microcomputers at their desks. Depending on the answer to that question, each contact was then asked either how a yes answer was justified with regard to expense and what the catalogers' response had been, or, in the case of a no answer, when such a situation might be expected, how it would be justified with regard to expense, what the expected reactions from catalogers would be in such a situation, or what reasons would be given for not providing catalogers with terminals. Each library was grouped as described below, depending upon the responses to the interviews. As in Rogers' study, not every library had a position clearly defined as head of cataloging, so the titles and some of the exact responsibilities of the person interviewed, and who filled out the follow-up questionnaire, varied from site to site. In most cases, however, the person who was responsible primarily for overseeing the original cataloging area of the library was interviewed, no matter what the actual title of the position might be.

In order to replicate Rogers' original design insofar as possible, the same survey instruments with essentially the same wording were used, with her permission. For true comparison purposes, this study covered exactly the same points that Rogers did in her study. The only differences were that this second study was conducted a year and a half later and used a different target population.

The interviews were used to sort the non-ARL libraries into the same four groups as the Rogers study with respect to individual automated workstations for professional catalogers. Those groups were:

Group A— Already automated (have provided individual automated workstations at professional catalogers' desks)
Group B— Being automated soon
Group C— Expected to automate, but could not say when
Group D— Did not expect to automate

As in Rogers' study, three different follow-up questionnaires were used for the libraries in the four groups. The questionnaire for Group A asked for information about specific types of equipment, costs, etc. The questionnaire for Group B was modified slightly to explore conditions anticipated when automation was completed. The last two groups, C & D, were sent the same follow-up questionnaire to examine alternatives to automated workstations and other related issues.

Other questions in each group attempted to assess expectations, results, responses or reactions, what levels of personnel perform certain functions in the department, and what, if any, other types of automation equipment are also available at a cataloger's workstation or in the cataloging area.

PROFILE OF THE POPULATION

Using data from all 100 interviews, the following information is a description of the general collections and professional staff sizes of the libraries in the target population. Comparisons are not made with the Rogers study here, because a general profile did not appear in her published report.

Collection size ranged from a low of 83,564 to a high of 1,981,655. The library with the smallest collection fell into Group A and the largest was in Group B. There were libraries in each group with collections of about 1,500,000.

The number of professional staff in each of the 100 libraries ranged from a low of 6 to a high of 57. The number of professional catalogers in each library ranged from a low of 1 to a high of 9.

The typical library was a member of the OCLC Online Computer Library Center (see table 2 below) and had a collection size of 795,688, a professional staff of 27.16 full-time equivalent (FTE) librarians, and a professional cataloging staff of 4.38 FTE catalogers. The average collection size, number of professional staff, and number of professional catalogers were all so close across the four groups that it could be assumed that these factors actually have very little bearing on the decision of whether or not to provide each cataloger with individual automated workstations. The overall profile of the population is illustrated in table 1.

TABLE 1

PROFILE OF POPULATION

Group	Average Collection Size	Average Professional Staff (FTE)	Average Professional Catalogers (FTE)
A	708,296	26.31	3.80
B	855,737	28.83	3.64
C	855,205	29.38	4.69
D	763,512	24.11	5.37
Overall Average	795,688	27.16	4.38

There were many systems represented in the sample. While all of the bibliographic utilities were represented, the majority of this population (86%) used OCLC. Only 6% were Research Libraries Information Network (RLIN) members or used both OCLC and RLIN. The remaining 8% were either Western Library Network (WLN) or NLC-UTLAS users. The bibliographic utilities in use can be seen in table 2.

Of the several local automation systems represented, 22% of the total population were NOTIS libraries, while the second-largest percentage (21%) had no local system yet. Of the 29 Group A libraries, 10 (almost 35%) were NOTIS libraries while 5 (17%) had no local system yet. The local automated systems represented in the population can be seen in table 3.

One interesting fact about the local systems in these academic libraries was that seven libraries were either on their second system or were in the process of migrating from one system to a second system. Four were moving from their first system to NOTIS, two were moving from their first

TABLE 2

BIBLIOGRAPHIC UTILITIES REPRESENTED IN POPULATION

Utility	Group A	Group B	Group C	Group D	Totals
OCLC	26	19	8	33	86
WLN	0	2	0	3	5
NLC/UTLAS	2	1	0	0	3
OCLC/RLIN	1	0	0	2	3
RLIN	0	2	0	1	3
	29	24	8	39	100

TABLE 3

AUTOMATED SYSTEMS REPRESENTED IN POPULATION

System	Group A	Group B	Group C	Group D	Totals
NOTIS	10	8	0	4	22
None	5	7	3	6	21
GEAC	0	2	1	4	7
Innovative	1	3	1	1	6
UNISYS	1	2	0	3	6
VTLS	1	0	1	4	6
CLSI	2	0	0	3	5
LS2000	1	0	0	4	5
CARL	0	1	2	1	4
DRA	3	0	0	0	3
In-House	1	0	0	2	3
WLN/LUMIN	1	0	0	2	3
Consortia	0	0	0	2	2
LCS	0	0	0	2	2
Other (1 each)	3	1	0	1	5
	29	24	8	39	100

system to Innovative Interfaces, and one was migrating from its present system but had not decided on a new system at the time of the survey.

DATA ANALYSIS

The data collected from both the interviews and the follow-up questionnaires were analyzed. None of the contacts declined to participate in the interview. After the interviews, the libraries were grouped as shown in table 4 and the appropriate questionnaires were mailed.

The breakdown of Groups A and B is fairly even in both studies, but there is a great difference between those groups and Group C in the two studies. The percentage of those who expected to automate but did not know when was much higher in Rogers' survey. However, slightly less than 40% of the participants did not expect to automate in the future to make up Group D, whereas only 21% of the ARL libraries fell into Group D in the first study.

Only one of the telephone respondents declined to answer a follow-up questionnaire by mail; therefore no questionnaire was mailed to that library. In addition, no questionnaire was mailed to the library where the researcher works (a Group B library at the time of the survey), because Rogers did not send one to Ohio State. Of the 98 questionnaires mailed, 78 (80%) were completed and returned, compared to 93 of the 112 (83%) returned in the Rogers study.

TABLE 4

POPULATION COMPARISONS AFTER TELEPHONE INTERVIEWS

	Non-ARL Population		ARL Population	
Group	No.	%	No.	%
A	29	29	15	12.9
B	24	24	15	12.9
C	8	8	60	51.7
D	39	39	25	21.6
Other	—	—	1	0.9
Totals	100	100	116	100.0

FINDINGS SPECIFIC TO EQUIPMENT

In the 22 Group A libraries that had already provided automated workstations and who responded to the mailed questionnaire, there were 13 different types and 23 different models of terminals or microcomputers being used as professional catalogers' workstations, compared to 8 types and 12 models in the 11 libraries in the same group in Rogers' study. Given the fact that twice as many libraries were in this group in the current study, the numbers of models and types were comparable to those in the same group in the original study. Also, some differences can be attributed to the year and a half time difference between the two studies. The 13 types included OCLC, International Business Machine (IBM), Telex, Wyse, Zenith, Unisys, and other, less frequently mentioned types. In the 15 libraries being automated soon, there were 11 different brands of terminals or microcomputers being considered for that purpose, compared to 6 in that same group in Rogers' study. In the Group A libraries, hardware costs quoted per workstation ranged from "free" (one library was able to get six free terminals by answering an ad on BitNet first!) to a high of about $3,600. In the Group B libraries, expected hardware costs ranged from "on-hand" to $3,400. As Rogers found, most of the workstations being used or considered were equipped for approximately $2,000. Nine of the 22 libraries in Group A, or 41% in this study, did not get new furniture to accommodate their computer equipment. This compares to 6 of 11 libraries, or 55%, in Group A in the Rogers study. Eight of the 15 (53%) Group B libraries in the current study expected they would get at least some new furniture for use with their equipment. This compares to 8 of 13 (62%) of the Group B libraries in Rogers' study.

Concerning other equipment related to automation, all groups were asked whether there was a CD-ROM player in the work area. Nineteen percent answered affirmatively, compared to 18% in Rogers' study, very nearly the same response in both studies. Some of the uses cited included *BIP+*, *LCSH*, LC name authorities, *Bibliofile*, *Marcive*, and searching the regional union catalog. All groups were asked (1) whether all, some, or none of their professional catalogers created new records at a terminal or microcomputer instead of writing or typing paper workforms when their own workstations were not automated and (2) what their plans were for the period following automation. The majority of libraries in all groups in this study reported no catalogers doing or expecting to do direct input, the same response as in the Rogers study. However, when the 37 libraries in Groups A and B of the second study were asked the same question regarding the situation (or expected situation) after automation, 16 responded "all" and 11 responded "some," compared to 11 and 7 in the Rogers study that expected to do direct input.

Catalogers in both studies who were doing direct input in Group C and D libraries were sharing terminals and therefore did not qualify, according to our definition of workstation, for either group A or B. Fifty percent of the Group C libraries and 44% of the Group D libraries responded that their professional catalogers had blocks of time scheduled for terminal use, compared to 53% and 47% in the Rogers study. As in the first study, the number of hours scheduled varied greatly: from 1 to 30 hours per week. In both studies, some respondents felt that sharing was the most efficient way to use terminals, while some others felt that batching work and working in a scheduled situation was not efficient. When asked how catalogers had reacted to doing more work on computers, the typical response was that most had reacted quite positively to the change. This was also the general response in Rogers' study. Very few responded that catalogers were resistant, although Rogers indicated that there might have been somewhat more reluctance among the more experienced catalogers.

A related issue that was identified indirectly in both studies was the trend toward creating cataloging records in the local online system without necessarily contributing them to a bibliographic utility. While this issue was not intended to be addressed in either study, it is a concern of both the utilities and the member libraries. I doubt that there has been any satisfactory solution in the time since Rogers' study, and it is certainly an issue that should be examined in future research.

FINDINGS SPECIFIC TO QUALITY AND PRODUCTION ISSUES

In both studies, productivity and quality of work were two areas addressed in the follow-up questionnaires sent to Groups A and B. When asked how the productivity of professional catalogers was affected by having terminals or microcomputers at their desks, 11 (50%) Group A libraries responded that productivity had increased, compared to four (36%) in Rogers' study. Two libraries in both studies reported that productivity decreased initially but later increased. Three (14%) believed productivity was not affected, compared to 2 (18%) in Rogers' study, and four (18%) thought it was too early to tell, compared to three (27%) in Rogers' study. Eleven of the 22 respondents, or 50% of the Group A libraries, thought that productivity had increased, compared to 4 of 11, or 36%, in Rogers' study.

Among Group B libraries, 7 of the 15 who responded, or about 47%, expected productivity to increase, compared to 5 of 13, or 38%, in Rogers' study. Five of the 15, or 33%, expected an increase following an initial decrease compared to 3 of 13, or 23%, in Rogers' study. Only 1 of the 15, or 7%, thought that productivity would not be affected, compared to 3 respondents, or 23% in Group B in Rogers' study. Two did not respond to the question. No one in either Group A or Group B in either study thought that productivity would decrease as a result of such automation.

Respondents in Group C and Group D were asked if any steps had been taken recently in their libraries to help professional catalogers improve their productivity to reduce the cost of original cataloging. Four of the Group C respondents, or 50%, responded yes, compared to 72% in Rogers' study. Thirteen, or 39%, of the respondents in Group D of this study reported that they had taken steps to help their catalogers improve their productivity, compared to 58% in Rogers' study.

The respondents were asked to describe specifically what had been done and how well it worked. Their responses are compiled, in no particular order, as follows:

- Descriptive cataloging for theses and dissertations prepared by paraprofessionals; catalogers assign only special notes and subject headings.
- Local theses/dissertations brief-listed only (no classification or subject headings).
- Brief-list and recycle some materials without copy. Save original work for things that might have copy later. In the meantime they are searchable by author or title online and may be requested.
- Send items without copy to WLN to catalog.
- Give more responsibility to graduate assistants in library science to prepare original work sheets, assign LC classification and subject headings (revised by a professional).
- Developed in-house software to pre-edit and fill in certain fields in work forms.
- Cooperative efforts for retrospective conversion projects, audiovisual cataloging, maps, serials, and music.
- Minimal-level cataloging for some older materials.
- Move terminal so that catalogers can directly input new records into OCLC to save time and improve accuracy.
- Very little original cataloging.
- Cut back number of references made in authority work.
- Ceased manual backup card name authority file even though they do not yet have complete authority control online.
- Shift authority work to post-cataloging.
- Hired pre-catalog searcher to help with authority work.
- Shifted most copy cataloging to civil service staff, who edit copy at the OCLC terminal instead of printing out and reviewing every LC record.
- Offer professional catalogers more than the traditional technical and intellectual

challenges of original cataloging; provide planning, supervisory, and managerial experience based on workflow and logical division of labor rather than on subject, format, or language.
- Professional workshops on specific cataloging aspects.
- Using paraprofessionals for more "higher-level" work.
- Catalogers encouraged to do easy material early in the month and save harder material for later.

When asked if it had been (or was expected to be) possible to cut costs in any area as a result of purchasing automated workstations, only 3 (14%) Group A libraries responded yes; 15 (68%) responded no; and 4 (18%) weren't certain. Of the Group B libraries, 6 (40%) responded yes; 5 (30%) responded no; and 4 (27%) weren't certain. In Rogers' study 4 (36%) responded yes; 5 (45%) responded no; and, 2 (18%) weren't certain in Group A and 2 (15%) responded yes; 7 (54%) responded no; and 2 (15%) were not certain in Group B.

Concerning quality, Group A and Group B libraries were asked how the quality of information being added to the library's catalog had been (or was expected to be) affected by professional catalogers having terminals or microcomputers at their desks. Fourteen (64%) of the Group A libraries reported that the effect was positive, 4 (18%) reported that there was no effect, and 4 (18%) were not certain. Among Group B libraries, 10 (67%) expected a positive effect, and 5 (30%) expected no effect. In Rogers' study, 5 (45%) of the Group A libraries reported that the effect was positive, the same number reported that there was no effect, and 1 (9%) was not certain. Of the Group B libraries in Rogers' study, 8 (62%) expected a positive effect and 5 (38%) expected no effect.

SUMMARY

Fifty-three percent of the non-ARL libraries surveyed already have, or will have in the near future, automated workstations for each professional cataloger, compared to 26% in Rogers' study. This seems to support the hypothesis that the smaller academic libraries might find it easier to provide automated workstations for catalogers, although size of collection within this population was not necessarily a factor. In the interviews, the support of the library administration and the ability of the library director to raise the money necessary to automate was frequently mentioned. An additional 8% expect to have these workstations sooner or later, the actual timing being dependent on money available at the individual institution and the overall cost of automation in general. This compares to 52% in Group C in Rogers' study. It seems that a much smaller percentage of this population would like to be more automated but could not say that it might be possible in the near future. The remaining 39%, compared to 21% in Rogers' study, did not expect to get automated workstations, although they weren't necessarily against automation. As suspected, the most common reason for not providing workstations or other aspects of automation was lack of money. Some libraries, however, were satisfied with their current work arrangements, while others cited building, cabling, or current system limitations as hindrances. One respondent felt that it was not safe to have people working at terminals for longer than one hour at a time.

Most respondents felt that it was too early to tell about the effect that automated workstations for professional catalogers would have on productivity and quality of work. However, in both studies, some libraries did report that automation had had a positive impact on these areas, and in fact, no libraries reported a negative impact that was more than temporary. The expected results of automation have been shown to be increased efficiency and quality of work as well as lower processing costs. If these expectations are not met in the long run, however, I suspect that libraries will continue to automate anyway. Comments made during the interviews indicated that most catalogers now see these tools of automation as the necessary tools for cataloging, just as the typewriter was at one time. Several people responded that it was essential that the cataloger have constant access to the online catalog that is available to the public in so many academic libraries today.

CONCLUSION

Comparisons between groups of academic libraries are valuable when it comes to assessing their progress toward total automation. Assumptions about the benefits of automation to efficiency made prior to this study seem to be valid. There needs to be more research on the topic of workstations for catalogers. Just how can maximum access be provided with minimum temporary disturbance to workflow and efficiency? Because the cost is not low for this or any facet of automation, studies and careful planning are required so that wise choices can be made by administrators who support total automation in libraries. If adding access is necessarily incremental due to the high cost of equipment, then planning for expansion of present machines and compatibility with future additional machines is essential. The cost of equipment will continue to be an important factor and might be the most important factor for those academic libraries that found themselves in Groups C and D of these studies, even if the justification of expected efficiency and reduced processing costs could be shown.

Evaluation and re-evaluation of achievements and reassessment of goals is a constant and ongoing process in libraries today. However well we think we are doing in meeting expectations and achieving goals, we cannot go back at this point. Using automation and making it work for libraries, at whatever stage the individual library finds itself in that process, is what studies such as Rogers' and the one described here are all about. If another library can see from either of the studies how it can better prepare for, implement, and benefit from whatever level of automation it can afford, then these two studies have been successful.

REFERENCES

1. Sally A. Rogers, "Automated Workstations for Professional Catalogers: A Survey of ARL Libraries," in *Building on the First Century: Proceedings of the Fifth National Conference of the Association of College and Research Libraries, Cincinnati, Ohio, April 5-8, 1989*, ed. Janice C. Fennell (Chicago: ACRL, 1989), p.131–34.
2. Diane Vizine-Goetz, "Cataloger's Assistant," *OCLC Newsletter* (Mar./Apr. 1989), p.7.
3. Randall W. Scott, "An Original Catalog Librarian's Perspective on Library Automation," *Library Journal* 112, no.18: 48–54 (Nov. 1, 1987).
4. Blaine Morrow, "SuperCAT Cataloger's Workstation," *CD-ROM Librarian* 4, no.8: 28-35 (Sept. 1989).
5. Rogers, "Automated Workstations," p.131.
6. *ACRL University Library Statistics, 1987–88: A Compilation of Statistics from One Hundred Non-ARL University Libraries*, comp. by Robert E. Molyneux (Chicago: ACRL, 1989).

pH: Only a Piece of the Preservation Puzzle: A Comparison of the Preservation Studies at Brigham Young, Yale, and Syracuse Universities

Matthew Nickerson

A paper-deterioration survey of the general collection of the Harold B. Lee Library at Brigham Young University (BYU) was conducted. A stratified random sampling technique was used, and the results were compared with those from surveys at Yale University and Syracuse University. Of the books at the Harold B. Lee Library, 75.5 percent had acidic paper (pH<5.4) and 1.9 percent were very brittle (broke at two double folds). Data from all three surveys were grouped by publication date so books of similar age could be compared. The three university collections showed very similar percentages of acidic books, but the brittleness percentages varied widely among the three studies. Results indicate that consistent recording of environmental factors such as temperature and humidity is necessary.

Although paper was invented some two thousand years ago, it was not until the second half of the twentieth century that scientists began studying its microscopic and molecular structures. This scientific interest in paper was due in large measure to deterioration witnessed in library collections.

The rapid deterioration of machine-made paper due to chemical breakdown was first studied and quantified by J. W. Barrow. Using an artificial aging process, his laboratory predicted a shelf life of fifty years for books published in the twentieth century.[1] Based on Barrow's pioneering work, four major causes for the chemical breakdown of paper have since been identified: oxidation, acid hydrolysis, photochemical stimulation, and environmental pollution.[2] Research has shown that acid hydrolysis is the principle cause of book paper deterioration and that pH is a reliable indicator of a paper's life span.[3]

Acidic chemicals were introduced into the papermaking process primarily during the advent of machine-made paper and with the introduction of wood as a source for cellulose fiber. Studies of the history of papermaking and the effect of mechanization on pH show a rise in the acid content of paper since the advent of

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machine-made paper in the early 1800s, peaking around 1900.[4]

However, the acid content of paper is not solely responsible for its deterioration. Richard Smith, in a review of research extending back to the nineteenth century, provided ample evidence that a complex intertwining of many factors is ultimately responsible for a paper's degradation. The data he reported confirm the key role of pH in the process but also indicate that storage temperature is an important secondary factor.[5] He concluded that storage conditions play a much larger role in the library preservation problem than is generally believed. Recent research conducted by the Library of Congress centered on other environmental factors and showed that variations in relative humidity can affect paper aging.[6]

Interest in the preservation problem began to take a more practical turn in the 1970s, as librarians began to assess the paper in their own collections. This was a very important step in bridging the gap between laboratory testing and the actual condition of the books in American collections.

Early, cursory inspections of some of the nation's largest library collections produced hypotheses predicting that as much as 30 percent of these collections had critically brittle paper. The Library of Congress reported one-third of its collection to be "too brittle to use" in 1973.[7] The first large, comprehensive, and statistically sound survey was done at the Yale University library, where 36,500 books were evaluated out of a collection of more than seven million volumes.[8] Yale's conclusion, that 37.1 percent of the collection was dangerously brittle and that an additional 82.6 percent was very acidic, caused renewed concern for the problems facing preservation librarians. A smaller study conducted at Stanford in 1979 had shown similar percentages.[9]

The large, well-documented survey at Yale prompted other universities to mount similar studies. Preservation surveys at Syracuse University (1985),[10] the Massachusetts Institute of Technology (1985),[11] and the University of Illinois at Urbana-Champaign (1988)[12] revealed similar percentages of acidic books in these research collections. However, the brittleness of the books in these surveys showed more variation.

However, these studies still were principally designed to determine the current condition of local collections, with little effort made to correlate different studies to learn more about paper permanence in general. Chrzastowski et al. take a tentative step in this direction by comparing their data with the Stanford study, whose protocol they followed, and proposing that environmental differences might have contributed to the variations in paper quality discovered between the two collections.

Brigham Young University (BYU) has had a longstanding commitment to book preservation. With an in-house book repair unit and a book conservation laboratory, the library struggles daily with repairing and reversing the myriad effects of book deterioration on the collection. Inspired by the Yale survey and encouraged by other studies, a paper-deterioration survey of the Harold B. Lee Library (HBLL) was undertaken.

The HBLL survey was designed to address these research questions:

1. What is the condition of the books in the Harold B. Lee Library general collection?
2. How does this condition compare with the findings of the surveys at Yale University and at Syracuse University in regard to (a) paper acidity and (b) brittleness?

The purpose of the study was twofold. First, the data would serve as valuable tools for assessing the current condition of the collection and in helping to make long-range planning and budgetary decisions. Second, the data would be compared to results from two similar surveys, which would help the library community begin to understand the similarities and differences in paper deterioration in collections throughout the nation.

The data compared with the HBLL study are from the preservation surveys of the Sterling Memorial Library at Yale University and the Bird Library at Syracuse University. These libraries were chosen for comparison because the surveys at these institutions included the three critical data points we wished to compare: pH, brittleness, and age.

METHODOLOGY

A stratified random sampling technique was used. The 2.5 million volumes in the collection were divided into four strata that corresponded to the four major classifications of the collection. These in turn corresponded to the four principle floors of the library: humanities, history and religion, sciences and technology and reference, and social science and government documents (see table 1). The third floor houses only the general reference books because of the large area taken up by administrative offices and the periodicals room. The library's Learning Resource Center is housed in half of the second floor, similarly reducing the number of books there. To balance the size of the strata the general reference books were included with the second-floor collection for this study.

CHOOSING A SAMPLE

The sample size chosen for this population allows for a 95 percent confidence level with a 5 percent tolerance level. Simply stated, this means there is one chance in twenty that the number that truly represents the population lies outside of a range surrounding the survey's calculated number plus or minus five percent.

For the sampling technique to be statistically viable every book had to have an equal opportunity to be selected. The basis for the random selection of the books was the ordinal position of the volume in the stacks. Sampling by length—choosing a random distance on a shelf and measuring to that position—was not used because it produces a bias in favor of thicker books.[13] Fussler's technique eliminates the bias by first sampling by length and then choosing the *n*th book beyond the measured mark, *n* being randomly chosen and staying constant throughout the sampling.[14] Sampling by length was invented to avoid the time-consuming counting of books in order to sample them. Because counting is necessary to avoid the bias we decided to drop the measuring altogether and randomly choose the ordinal position of the book on the shelf for sampling. This method eliminates the need to haul a measuring device through the stacks and provides the same accuracy as Fussler's technique but requires a little more counting.

Using computer-generated worksheets, 384 volumes were randomly chosen from each floor by describing their locations in five ways: (1) floor, (2) row, (3) section, (4) shelf, and (5) ordinal position on the shelf (see example below). The floor and row designations are straightforward—each floor having a set number of rows—but a variety of factors cause the section, shelf, and book position numbers to fluctuate.

For example, the number of sections in a row varies from three to fourteen throughout the library, and all the shelves in a given section are not always in use. Also, the number of books on a shelf may vary from only a few to as many as one hundred, depending on whether the shelf is full and on the thickness of the books it contains. For this reason, more than one random number was listed for each of the three final variables in order to increase the chances of having a number that would correspond to the actual space selected and greatly reduce the number of rejects. When the first number in one of these areas was not usable then the next one was used, and so on, until a usable number was found. A pretest helped us determine how many random numbers to include in each area to avoid a high number of rejects.

TABLE 1

NUMBER AND PERCENTAGE OF VOLUMES PER FLOOR

Floor	Number of Volumes	Proportion of Collection (%)
1	907,454	35.7
2	479,955	18.8
4	513,372	20.2
5	642,864	25.3
Total	2,543,645	100.0

To reduce rejects further, the computer program that created the worksheets limited the random numbers selected for each area to remain within the parameters of the library layout. For example, numbers selecting the row would not exceed the actual number of rows on the floor being searched. Each of the criteria was similarly limited (see example at bottom of the page).

GATHERING THE DATA

For each book selected, the call number and the date of publication were recorded for identification and dating. If no publication date was found then the copyright date was used. Each book was then tested for paper pH and brittleness. Finally, the physical condition of the book was recorded. All data were recorded directly on worksheets. Below each line of selection numbers was a line for recording the data from the book identified (see example below).

The survey was carried out by the author with the help of an assistant. The process of using the worksheet was clear to both investigators, as were the procedures for determining pH, brittleness, and condition. Both investigators were also equipped with a guide to help translate dates recorded in Roman numerals.

The pH was obtained using a Light Impressions pH Testing Pen containing bromocresol green. A small mark was made with the pH pen in the gutter margin of the book. Within approximately thirty seconds a chemical reaction takes place, with the color of the mark changing to indicate the paper's pH range: yellow = very acidic; green = acidic; blue = slightly acidic. This test can only measure degrees of acidity and cannot distinguish books printed on neutral or alkaline paper.

Several books were marked as a test to verify that both investigators were perceiving the colors and making the pH determination in a uniform way. The green middle range was necessarily the broadest and a definite yellow or blue indication was required to record either extreme.

The paper brittleness was determined by a corner-fold test. The top corner of the last page (not the end-paper) was folded and creased repeatedly, alternating the direction of the fold, until the fold broke or until it had been folded eight successive times. Following the protocol followed by Yale and Syracuse, paper capable of eight successive folds (four double folds) without breaking was considered not brittle. The number of double folds was the measure of brittleness and was recorded on the worksheet.

Judging the physical condition of the book was made as simple as possible. The main concern was to determine whether the book was in need of immediate repair. The established criterion was whether or not the book was in more than one piece. If the book was in more than one piece it was judged to be in need of repair, regardless of the degree of separation. That is, it did not matter whether only one page was separated from the text block or whether the entire cover had been separated. In either case the book was judged to be in need of repair. The condition according to this criterion was recorded on the worksheet.

RESULTS

HAROLD B. LEE LIBRARY SURVEY

Acidity

A summary comparing the data for the four floors is found in table 2. Comparing the acidity of the collections on the four floors, a one-way analysis of variance indicated that only the second floor (science and technology and general reference) showed a significant difference at the .05 confidence level. This stratum proved to be less acidic than the other three strata, with only 10.4 percent having a pH below 3.8.

The final column in table 2 gives the data calculated for the entire library. These

Example:

Case	Floor	Row	Section	Shelf	Book
4	1	3	12 6 4 9	4 6 1	34 66 74 12 31 89 2 20 59 45

call # ____________ pub. date ____ pH ____ folds ___ cond. _______

numbers were generated by first calculating the total number of books per floor for a given criterion (such as "very acidic") and then adding the numbers for all the floors together and dividing by the total number of volumes in the collection.

Overall, 75.5 percent of the books tested have very acidic paper (pH<5.4), while only 3.8 percent are brittle (broke during four double folds).

ACIDITY AND BRITTLENESS

A chi-square test on the cross-tabulation of acidity by brittleness showed that these variables are not independent. Of those pages that were judged very brittle by the corner-fold test, a full 90 percent were also very acidic. On the other hand, none of the pages found to be only slightly acidic were judged to be brittle.

Percentages of books requiring immediate repair reflected the levels of acidity for any given floor. For example, the fifth floor had the highest percentage of books with very acidic paper, 28.6 percent, and also had the highest percentage requiring immediate repair, 4.2 percent.

These data corroborate the correlation among acidity, brittleness, and deterioration that has been reported by other surveys of this kind. Though the present levels of brittleness are not as high as those reported by other libraries, that 75.5 percent of the HBLL general collection was found to be acidic or very acidic does not bode well for the future of this collection. This percentage extrapolates to reveal that almost two million volumes in the HBLL collection have acidic paper.

COMPARING THREE UNIVERSITY SURVEYS

Figures 1 and 2 compare the acidity and brittleness levels of three large university research collections, the Harold B. Lee Library, Brigham Young University; the Sterling Memorial Library, Yale University; and the Bird Library, Syracuse University. Because of the differences in the overall average ages of the three collections, data were organized by publication date so books of similar age would be compared.

ACIDITY

Figure 1 shows the percentages of books found to have pH<5.4 for each of the indicated publication periods. This curve agrees favorably with other published data and shows a marked similarity in these three collections. Because acidity is inherent to the papermaking process it is not surprising that these three large, comprehensive collections would show similar curves, because their books are all published on paper from the same world producers.

TABLE 2

COMPARATIVE RESULTS BY FLOOR

	1 %	2 %	4 %	5 %	HBLL %
Acidity					
very acidic (pH<3.8)	26.8	10.4	23.5	28.6	23.5
acidic (3.8<pH<5.4)	52.3	57.2	53.3	46.5	52.0
slightly acidic (pH.5.4)	20.9	32.4	23.2	24.9	24.5
Brittleness					
1–2 double folds	1.0	0.3	3.6	2.9	1.9
2–4 double folds	1.3	0.5	3.4	2.4	1.9
did not break	97.7	99.2	93.0	94.8	96.3
Condition					
immediate repair	3.4	2.3	2.6	4.2	3.2

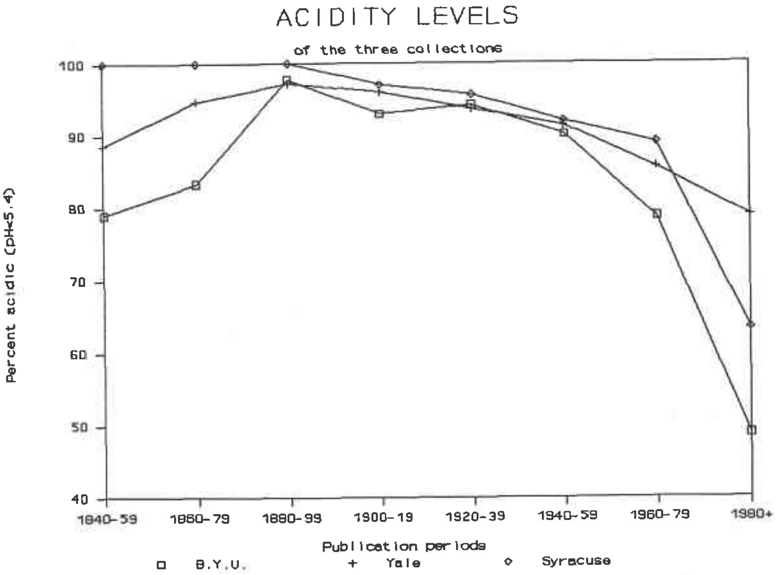

Figure 1. Percentage of Acidic Books Surveyed by Publication Date and Institution.

BRITTLENESS

Figure 2 shows the percentages of brittle books, those with paper that broke during four double folds, for the same time periods. The focus within library preservation has always been on acidity, and paper deterioration has been blamed on low pH levels. The most important discovery of this study is the difference in brittleness observed among the three library collections when their pH levels are so similar. The shape of the three curves in figure 2 reflects the rise and fall of acidity in paper during the last 150 years illustrated in figure 1 and supports the well-documented correlation between acidity and brittleness. The different amplitudes of the curves in figure 2 suggest that there are other important factors contributing to paper deterioration in addition to acid.

RELATED INFORMATION AND HYPOTHESES

Initial investigations had indicated that the HBLL had a lower percentage of brittle books than was being seen in published surveys of the time. It is good news to see the full survey confirming the preliminary numbers. The limited environmental data available make it impossible to state any definite conclusions as to why the HBLL collection, though just as acidic as the others, shows considerably less embrittlement. However, some surmising based on the research to date might be profitable for future researchers.

In considering the positive environmental factors that might have contributed to the greatly reduced brittleness in the HBLL books, two factors seem paramount. First is the geographic location of the library. Situated in Provo, Utah, in the arid intermountain west, the library's humidity is considerably lower than that in New York or Connecticut. Second, this collection has been relatively free of the extreme temperature and humidity fluctuations of uncontrolled environments, because it has been housed in an air-conditioned building since 1961.

Major growth of the HBLL general collection took place in the 1960s, and many of the older books were acquired through retrospective purchasing during that time. The prior history of these books is unknown. For some of these volumes that could amount to more than one hundred years. Obviously, where and how they were

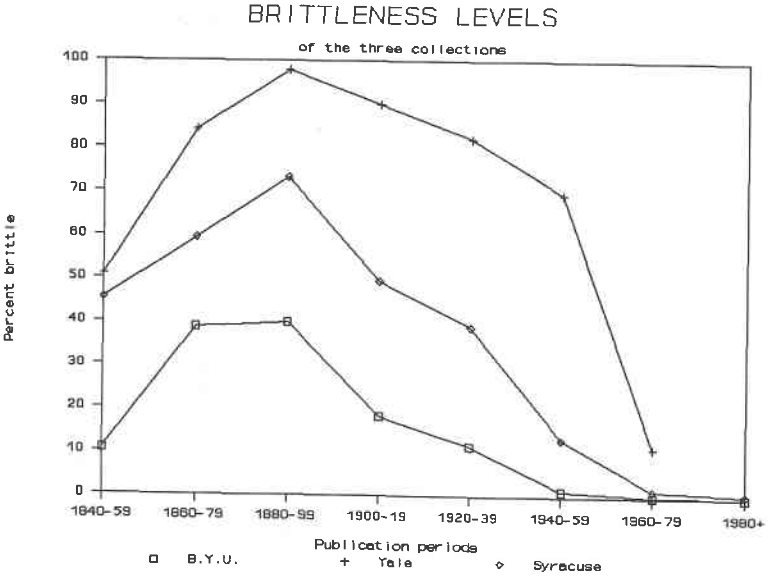

Figure 2. Percentage of Brittle Books Surveyed by Publication Date and Institution.

kept prior to being acquired for this collection have shaped their current condition. But by the same token it is also unclear what overriding beneficial effect the last thirty years at HBLL might have had.

FUTURE STUDIES

Comparing data is difficult when different protocols are employed in different studies. The time-consuming portion of these studies is roaming through the stacks to collect an accurate random sample. Once a book has been selected it is worth the few extra seconds or minutes required to extract all important basic information. Our suggested minimum is: pH, brittleness, publication date, and physical condition. The results of our study indicate that consistent recording of environmental factors (such as temperature and humidity) is also necessary.

It is important for researchers who conduct preservation surveys of this kind in the future to realize that the value is twofold. Most libraries undertake this type of survey to measure the condition of their collection and to help them determine their specific preservation needs. At the same time, it is important to remember that the data being gathered are also a vital portion of the growing picture of book deterioration and preservation nationwide. It is only by compiling data from many collections that we will be able to begin to piece together the complicated process involved in paper deterioration. Through analyzing how such key factors as pH, temperature, and humidity vary among different collections and different locations, their effects both singly and cumulatively can begin to be understood.

REFERENCES

1. W. J. Barrow, *Deterioration of Book Stock, Causes and Remedies: Two Studies on the Permanence of Book Paper* (Richmond, Va.: The Virginia State Library, 1959), p.15.
2. Robert DeCandido, "Preserving Our Library Materials," *The Library Scene* 7 no.3:10–12 (Sept./Dec. 1978).
3. Verner W. Clapp, "The Story of Permanent/Durable Book Paper," *Restaurator Supplement* 3, p.7 (1972).
4. Timothy D. Barrett, "Early European Papers/Contemporary Conservation Papers: A Report on Research Undertaken from Fall 1984 through Fall 1987," *The Paper Conservator* 13:39 (1989).
5. Richard Daniel Smith, "Paper Imper-

manence as a Consequence of pH and Storage Conditions," *Library Quarterly* 39:153–95 (1969).
6. Chandru J. Shahani, Frank H. Hengemihle, and Norman Weberg, "The Effect of Variations in Relative Humidity on the Accelerated Aging of Paper," in *Historic Textile and Paper Materials II* (Washington, D.C.: American Chemical Society, 1989), p.63–80.
7. Council on Library Resources, *Brittle Books: Report of the Committee on Preservation and Access* (Washington, D.C.: Council on Library Resources, 1986).
8. Gay Walker and others, "The Yale Survey: A Large-Scale Study of the Book Deterioration in the Yale University Library," *College & Research Libraries* 46:111–32 (1985).
9. Sarah Buchanan and Sandra Coleman, "Deterioration Survey of the Stanford University Libraries Green Library Stack Collection," in *Preservation Planning Program Resource Notebook*, comp. Pamela W. Darling, rev. ed. by Wesley L. Boomgarden (Washington, D.C.: Association of Research Libraries, Office of Management Studies, 1987), p.189–221.
10. Randall Bond and others, "Preservation Study at the Syracuse University Library," *College & Research Libraries* 48:132–47 (1987).
11. Nancy Carlson Schrock, "Preservation in the MIT Libraries: A Collection Management Approach," *Science and Technology Libraries* 7 no.3:60–62 (Spring 1987).
12. Tina Chrzastowski, David Cobb, Nancy Davis, Jean Geil, Betsy Kruger, "Library Collection Deterioration: A Study at the University of Illinois at Urbana-Champaign," *College & Research Libraries* 50:577–83 (1989).
13. Ronald Rousseau, "The Fussler Sampling Technique," *Journal of the American Society for Information Science* 39:421–22 (1988).
14. Herman H. Fussler and Julian L. Simon, *Patterns in the Use of Books in Large Research Libraries* (Chicago: Univ. of Chicago Pr., 1969).

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Book Reviews

Lawrence W. S. Auld, Editor

Bibliographic Access in Europe: First International Conference. Ed. by Lorcan Dempsey. Brookfield, Vt.: Gower, 1990. 315p. $69.95 (ISBN 0-566-03644-4). LC 90-3448.

This book confirms that Western European bibliographic access reflects multiple library traditions in a Europe headed for increased unification. Compared with the relative uniformity of North American bibliographic access, the European experience fosters diversity with greater opportunity for innovation. Countries are at various stages of bibliographic sophistication and cooperation, with the less-developed countries taking advantage of lessons learned elsewhere.

The thirty-three papers in the volume are the proceedings of a conference that was organized by the Centre for Bibliographic Management and held at the University of Bath on September 14–17, 1989. Arranged in six thematic sections, the papers extend beyond narrow definitions of bibliographic access to include topics such as networks and periodical databases. The reporting is concise, with few papers extending beyond ten pages. To provide a unity often lacking in conference proceedings, Paula Goossens gives an on-the-spot "conference summing up" while the editor, Lorcan Dempsey, has prepared a scholarly introduction to put the individual presentations into context.

Many papers describe the experiences of individual networks or libraries. Their eclecticism is one of the principal strengths of the volume, as they present the European experience in all of its diversity. The Finnish government, for example, purchased the same online public access catalog (VTLS) for all Finnish academic libraries to foster uniform access. Formats discussed range from rare books to computer files. Others transcend local concerns. The excellent keynote address by Michael Smethurst of the British Library recommends a pragmatic approach of offering patrons "access to machine-readable catalogues in whatever formats and with whatever standards exist" (p.34).

Standards, seen both as a help and as a hindrance to improved bibliographic access, may be the critical issue for European libraries. This theme runs throughout the volume and is the focus of the final section, where the four authors are not optimistic about efforts to harmonize the diverse cataloging and linguistic traditions.

I recommend purchase of this somewhat expensive volume for larger collections with interest in international library developments. Most librarians should find something of interest. All will discover that innovation in bibliographic access is not restricted to this side of the Atlantic.—*Robert P. Holley, Wayne State University, Detroit.*

Cataloging Motion Pictures and Videorecordings. By Nancy B. Olson. Ed. by Edward Swanson. Minnesota *AACR2* Trainers Series, no.1. Lake Crystal, Minn.: Soldier Creek Pr., 1991. 150p. paper, $25 (ISBN 0-936996-38-2).

This is the first in a new series of manuals to be published in the Minnesota *AACR2* Trainers Series. It is based on the earlier text *A Manual of* AACR2 *Examples for Motion Pictures and Videorecordings*, by the author and Jean Aichele (Soldier Creek Pr., 1981) but is considerably expanded in scope and in number and types of examples. In addition to descriptive cataloging, which remains the primary focus, Olson has included short discussions on access points and subject cataloging as they relate to films and videos. She also cites Library of Congress and OCLC guidelines for cataloging locally made videos.

Descriptive cataloging follows the 1988 revision of the *Anglo-American Cataloguing Rules*, second edition (AACR2), focusing on the rules for these materials in chapter 7. Although the rules themselves are not included, they are highlighted for significant points of application for each area of the bibliographic record. Relevant Library of Congress rule interpretations are also cited. This brief portion of the manual (twenty-four pages) is a prelude to the examples, forty altogether, that make up the remainder of the text.

The range of examples illustrates both common and more complex cataloging problems. All examples nicely capture the title and credit screens of the items, each of which is shown cataloged in both MARC coded and card formats. The majority of the examples are videos, a large number of which are copies of feature films. Several, such as sets, are cataloged showing different bibliographic treatments. Newer forms of material, so-called interactive media, are discussed, but no examples are provided.

Audiences most likely to benefit from this manual are small school and public libraries with limited professional staff and cataloging students who are looking for practical applications of chapter 7 rules. The emphasis on examples begs the question as to what, if any, criteria were used in their selection and underscores the importance of providing accurate transcription of cataloging data and associated MARC coding (e.g., example 3 shows "Ned Sparks" in the credits, which is recorded as "New Sparks" in the bibliographic record; example 20 gives author Tolkien in an access point without MARC coding for the full form of the name). These inaccuracies, although relatively few, deflect from an otherwise carefully produced and useful text.—*Ann M. Sandberg-Fox, Library of Congress, Washington, D.C.*

Cataloging: The Professional Development Cycle. Ed. by Sheila S. Intner and Janet Swan Hill. New Directions in Information Management, no.26. Westport, Conn.: Greenwood, 1991. 159p. $37.95 (ISBN 0-313-27254-9). LC 90-19797.

"All of the library schools in the United States graduating all of the students they currently graduate cannot replace the librarians who will retire by the year 2000" (p.16). Thus, James Matarazzo neatly summarizes the crisis in recruitment that confronts our profession in general and cataloging in particular. The crisis is the focus of this second volume from the 1989 Simmons College Symposium on Recruiting, Educating, and Training Cataloging Librarians. The first volume, *Recruiting, Educating, and Training Cataloging Librarians: Solving the Problems* (Greenwood, 1989), contains the formal conference papers, while this second volume of new material contains oral presentations and edited versions of discussions.

Cataloging: the Professional Development Cycle is considerably briefer than the 430-page initial volume, but it follows the same division into sessions on recruitment, educating, and training. Each session is introduced with a keynote presentation, continued with briefer comments from follow-up speakers, and wrapped up with transcripts of the discussions.

Although the volume is carefully edited, it preserves the flavor of the actual conference in its informality and loose structure. The oral presentations occasionally wander from the focus on cataloging, as oral presentations commonly do. The discussions conclude when time expires without always reaching a consensus. In such disorganization lies much of the charm and utility of this title.

It is unfortunate that only two of the twenty-three contributors were practicing catalogers. Nevertheless, few catalogers will find any surprises in the presentations that link recruitment problems with poor salaries, wretched working conditions, and low prestige. They might raise a skeptical eyebrow when they read that educators agree that cataloging appreciation courses are worthwhile. And they might sigh when they find that Joseph Matthews tries to rekindle a thesis that burned out with the artificial intelligence euphoria of the

1970s—that computers are ready to handle the "details" of cataloging as soon as we give them the chance.

Both volumes from the Simmons conference belong in library science libraries and in the professional collections of catalog departments. If acquisitions funds are tight, choose *Cataloging: the Professional Development Cycle* over the first volume. It covers the same territory but adds the virtues of briefness and accessibility.—*David Gleim, University of North Carolina at Chapel Hill.*

Collection Development in College Libraries. Ed. by Joanne Schneider Hill, William E. Hannaford, Jr., and Ronald H. Epp. Chicago: American Library Assn., 1991. 214p. $45 (ISBN 0-8389-0559-5). LC 90-27006.

As college librarians involved in collection development are well aware, the literature of collection development has, to date, focused primarily on large academic and research libraries, leaving college librarians to extrapolate for themselves such information as might be useful in their smaller, teaching-oriented institutions. This collection of twenty essays, directed primarily to collection development in smaller college libraries, aims to rectify that bias.

The book is divided into five sections. The first section is a debate on the differences between college and university libraries. M. F. Casserly discusses philosophical differences, including the different roles of students and faculty. Joan H. Worley demonstrates the advantages that small libraries have over large ones in terms of mission and service. However, C. Roger Davis, in the only divisive article in the collection (he calls himself a devil's advocate), maintains that there is no difference except one of scale and that both classes of institutions have similar goals and similar approaches.

The second section presents issues that have emerged in recent years. Thomas W. Leonhardt is especially thought-provoking, urging simplification and criticizing overzealous proponents of the various conspectus models, especially in smaller libraries, where librarians are often asked to accept the value of such massive projects a priori. Thomas G. Kirk presents a highly theoretical management approach to collection development in which he suggests applying contingency theory to the field. William E. Hannaford discusses ethics versus expediency in collection development.

The third section explores the specific activities that result in effective collection development. Evan Farber's essay is a description of the symbiotic relationship between librarians and faculty, with collection development seen as an extension of an effective bibliographic instruction program. Michael S. Freeman criticizes the overuse of allocation formulas in many college libraries and suggests that the formulas might be replaced with good judgment in many cases. Willis E. Bridegam presents a step-by-step approach to dealing with new faculty, courses, and programs. Richard Hume Werking recounts Trinity University Library's approach towards achieving a truly comprehensive library collection. Herbert D. Safford and Katherine F. Martin discuss collection management versus collection development, preferring the former as the more dynamic term, because it also encompasses weeding, deselection, gifts, and archives management.

The fourth section on the role of the college faculty in collection development is especially useful. Ronald H. Epp uses the 1985 Survey of Scholars to demonstrate faculty use of libraries; however, his essay does not seem to speak directly either to collection development or to college libraries specifically. Larry R. Oberg suggests that college collection development librarians focus overly on students, and he details a project at Albion College to develop more support for faculty research. Larry Hardesty presents an historical perspective on the role of faculty in teaching institutions. He suggests that the attitudes of today's faculty at large universities and small colleges are quite similar and that it is essential for librarians to share collection development responsibilities with the faculty, because teaching faculty control the curriculum. The necessity for faculty involvement in collection development is further argued in the article by Mary C. and John R. Scudder.

The fifth section embraces current trends in collection development. Both Wanda Dole and Ann Niles suggest that approval plans can be as useful in small college libraries as in large university libraries, but they might need to be implemented differently. The final two essays, one by Charlotte B. Brown and Kathleen Moretto Spencer, the other by Joanne Schneider Hill, address preservation, which is too often a last priority for small college libraries.

The book closes with an excellent, useful bibliography by Peter V. Deekle. Unfortunately, there is no index. As in any anthology, the styles of the essays vary from author to author. Some of the essays are highly philosophical, while others stress the differences between college and university libraries. *Collection Development in College Libraries* is welcome professional reading for all college librarians with collection development responsibilities.—*Mary Margaret Benson, Linfield College, McMinnville, Oregon.*

Collection Management in Academic Libraries. Ed. by Clare Jenkins and Mary Morley. Brookfield, Vt.: Gower, 1991. 289p. $79.95 (ISBN 0-566-03635-5). LC 90-23391.

Collection Management in Academic Libraries is an overview of current issues and concerns in the management of academic library collections in the United Kingdom. Editors Clare Jenkins and Mary Morley acknowledge a relative scarcity of literature on collection management as a coordinated whole rather than as discrete tasks. The primary audiences are identified as library managers and students of library and information science.

There are eleven chapters in this volume, three of them authored by American librarians. All contributors are library managers who currently have or previously have had collection management responsibilities. The first three chapters are concerned with general collection management topics. Chapter 1 deals with the organization of collection management in academic libraries and draws heavily upon American sources. Chapter 2, by Geoffrey Ford, is a clearly written and easily readable essay on finance and budgeting, including critiques of various budget-allocation formulae. In the third chapter, Ian Winkworth discusses performance measurement and provides a good explanation of how to choose and apply performance indicators using "base data" such as clientele and institutional and library objectives.

The remaining chapters take up specific topics in collection management. Ian Lovecy discusses the impact of automated systems on collection management, including online selection aids (e.g., *Books in Print Plus*), analysis of circulation data, and database comparisons between libraries' collections (such as those offered by bibliographic utilities).

Douglas Duchin, an American librarian with previous experience as a vendor, contributes a chapter on suppliers, which includes a brief history of U.S. vendor services, as well as current trends including out-of-print search services, direct access to vendor databases, and statistical reports (such as volume of firm orders or purchases by subject or press).

Other chapters provide introductions to the management of serials and nonbook collections. Another concerns the influence of library users on collection management. A chapter on deselection and storage (stock revision, relegation, and retention) is contributed by American librarians Sharon Bonk and Sara Williams. The chapter on cooperative collection development is also authored by an American, Patricia Bril. A final chapter describes the development, mission, and current role of the British Library.

The book concludes with a helpful glossary that decodes American and British acronyms, which are used liberally throughout the book. There is also a useful index.

While interesting and readable, *Collection Management in Academic Libraries* could not be used alone as a handbook or as a textbook. Many of the topics are quite broadly painted and suffer from a lack of in-depth discussion. American collection development librarians will find little that is new. The literature cited is recent but relies heavily on U.S. sources. The British viewpoint, however, could well be of interest to U.S. librarians looking for a fresh slant. Library school teachers and students will be interested in the comparative aspects of collection management. Unfortunately, the $79.95 price is prohibitive for individuals, but the book is recommended for library school and large professional collections.—*Judith Lee Palmer, Irving Public Library System, Irving, Texas.*

The Good Serials Department. Ed. by Peter Gellatly. Binghamton, N.Y.: Haworth, 1990. 186p. $29.95 (ISBN 0-86656-962-6). LC 90-44562. Also published as *The Serials Librarian*, v.19, nos. 1/2 (1990).

The Good Serials Department is a collection of thirteen enlightening articles on the day-to-day operation of serials departments in academic libraries and a national library. As is pointed out by editor Peter Gellatly in the first chapter, it is timely that *The Serials Librarian* has devoted an entire issue on the organization, responsibilities, and workflow of the various units within (or, in some cases, within and without) the serials department. This book shows that "good" serials departments or units can be of any size, shape, or form and that they are receptive to change, especially in the transition from a manual to an online environment. No perfect serials department exists, but there are many that can be considered to be good. Such serials departments, as stated by Gellatly, are "alive and well and performing with considerable brilliance" (p.2).

The articles cover the historical and organizational background of the serials departments and cooperating units and their current situations; the details of how serials operations (e.g., ordering, claiming, receiving, cataloging, collection maintenance, and public service) are performed; and the prospects for the near future. Some highlights from selected articles include: Betsy Kruger (University of Illinois at Urbana-Champaign) reports on serials management in a decentralized environment; Jean Walter Farrington narrates the conversion of serials operations to NOTIS at the University of Pennsylvania; Sue Anne Harrington describes the integrated serials department at the University of Oklahoma, where the serials operations are mostly manual but will soon be transferred to the NOTIS serials control module; Marifran Bustion mentions the importance of communication and cooperation among the segregated serials operations at Texas A&M; Janet Arcand and others discuss serials operations at Iowa State; Pamela R. McKay emphasizes the necessity of the public service function of the Worcester State College periodicals department; and Paul Robert Green details the serials operation activities in the University of Leeds science and engineering library, noting that communication is crucial for good serials management.

Overall, this book is well organized and well written. It is complemented by a useful index. Each article is preceded by an informative summary, and some articles contain bibliographical references or bibliographies. The references by Hanyu Tao et al. on the Shanghai Library relating to Chinese perceptions of "periodicals" and "serials," and the information on Chinese characters, are especially helpful. The inclusion of organizational charts for the Shanghai Library and the California State University at Fullerton in Tao's and Teresa Malinowski's articles are extremely valuable in understanding the interrelationships of the various units of the library and the serials department. The omission of organization charts in the other articles is a drawback. Because public and community college libraries also work with serials, this work could have included representative articles on their perspectives on serials management, too. *The Good Serials Department* is not a textbook on serials management; rather, it is a series of case studies. This book will be an asset for any serials professional or paraprofessional who would like exemplars of successful serials departments.—*Margaret Prentice Hecker, Kansas State University, Manhattan.*

Indexing and Abstracting in Theory and Practice. By F. W. Lancaster. Champaign, Ill.: University of Illinois, Graduate School of Library and Information Science, 1991. 328p. $39.50. (ISBN 0-87845-083-1).

The preface and introduction of this textbook, which is based on the author's course material for Arab students in Cairo in 1986, clearly indicate what the title does not, namely that it is solely concerned with abstracting and indexing (A&I) of databases, specifically excluding back-of-book indexes. For the latter, Lancaster recommends two textbooks that are respectively nineteen and twelve years old (perhaps because he believes that nonfiction books are headed for oblivion, to be replaced by electronic forms of communication). Despite the fact that the chapters on indexing principles and practice are partially applicable also to back-of-book indexing, this is a serious and unnecessary limitation in a text intended for the present generation of students, among whom there will presumably be some who will have to index books and other monographic documents.

Throughout the book, the close affinity of indexing to abstracting is strongly stressed. The explication of basic concepts such as aboutness, exhaustivity, and specificity is admirably clear and supported by good examples, demolishing some straw men elaborately set up by self-styled indexing "theoreticians." Consistency and quality of indexing, and the types and functions of abstracts and techniques of writing them, as well as the evaluation of indexes and abstracts, form the core of the book. A lengthy chapter is devoted to the practices of A&I services, amply demonstrated by reproductions of pages or sections (which are, however, in many instances reduced to near-illegibility, as are other "exhibits" throughout the book).

The chapter on "enhancing" indexing is dysfunctional, as it deals at length with largely extinct animals such as links, roles, semantic infixes, and telegraphic abstracts (a specimen of which looks like a cryptogram generated by the German "Enigma" machine of World War II fame) but devotes all too little space to the topic of subheadings, which is notoriously difficult to teach to students of indexing.

The chapter on the indexing of "imaginative works" (that is, fiction, poetry, and drama), somewhat incongruously positioned between the discussion of enhancing and that of natural language, stresses the need for such indexing, which up to now has almost never been considered, except for some attempts in Denmark.

Natural language versus controlled vocabularies is treated in the next chapter, in which Lancaster, after exposing faulty methodology and sloppy reporting in many of the comparative investigations performed during the past three decades, concludes that "a post-controlled vocabulary can offer all the advantages of natural language with many of the attributes of the pre-controlled vocabulary" (p.216). The next chapter on automatic indexing tries mightily to show that this is feasible, although virtually all systems surveyed need some human intervention to work properly, thus standing the dictionary definition of "automatic" on its head. All examples are drawn from science and technology; none are from the social sciences or humanities, where fully automatic systems are bound to fail because of the vagaries and idiosyncracies of the vocabulary in these fields. Lancaster deplores the absence of recent review articles on automatic indexing but seems to be unaware of an excellent recent review (perhaps because of its pessimistic outlook?).[1] As to automatic indexing, however, Lancaster seems to agree with Kuhlen's opinion that "abstracting . . . is an intellectual art and as such not directly transferable to automatic procedures."[2] He also dismisses entirely any potential contribution of artificial intelligence to either automatic indexing or abstracting.

The last text chapter, on the future of A&I services, is an only slightly updated version of a coauthored 1982 paper, in which most references date from the 1970s and early 1980s, thus allowing the reader to assess the accuracy or otherwise of the authors' crystal ball for the 1980s from the vantage point of the 1990s. Only the last three pages deal with potential future developments, envisaging the gradual disappearance of paper-based textbooks, journals, and A&I services in a fully electronic interactive brave new world, a scenario the author himself calls "a fairy tale." The last two chapters are devoted to highly useful practical exercises in A&I.

There are a few flies in the ointment. Indexers are invariably described as being male, which will not endear Lancaster to his largely female audience. Foreign languages are either "obscure" or "difficult," which they are only to those who do not know them. In the chapter on precoordinate indexes and elsewhere, indexing systems invented over the past seventy years, ranging from the ingenious to the weird, are indiscriminately discussed and exemplified as if they were still useful and viable. This, in a textbook for novices, is unnecessary and misleading. Not that an evaluative history of indexing systems is not needed. Quite to the contrary: Lancaster, whose work has been contemporaneous with most of these systems and who obviously has extensive documentation on them, is probably in the best position to write such a history, which would be a splendid contribution to information science.

Finally, the bibliography of 218 items is impressive, but it lists Czech, Danish, and Russian articles (some even without title translation!), which must have taxed the ingenuity of students in Cairo no less than they will puzzle the average American reader; there are also more than thirty internal reports and doctoral theses, which are virtually unobtainable for anyone not having access to the author's own file. Missing, however, is any reference to my own international bibliography of A&I,[3] continued in *The Indexer* from 1986 to 1988, in which readers would have found 88 percent of the cited, publicly available references as well as more than 3,600 other items pertaining to various aspects of A&I in English and in twenty-five "obscure" languages. The book is virtually free from typos, except on page 106, where "ambiguous" (in the line above Exhibit 44) should be "unambiguous," and on page 312, where the name Uhlman is misspelled. However, such relatively minor defects do not diminish the value of this work, which will probably become the standard treatment of the subject for a long time to come.—*Hans H. Wellisch, University of Maryland.*

REFERENCES

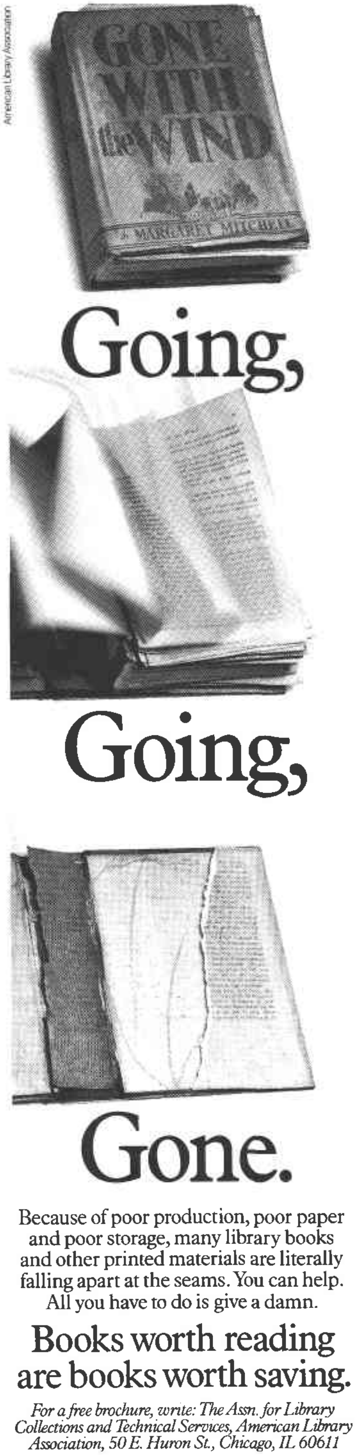
1. C. Korycinski and A. F. Newell, "Natural-Language Processing and Automatic Indexing," *The Indexer* 17:21–29 (Apr. 1990).
2. R. Kuhlen, "Some Similarities and Differences between Intellectual and Machine Text Understanding for the Purpose of Abstracting," in *Representation and Exchange of Knowledge as a Basis of Information Processes*, ed. H. J. Dietschmann, (Amsterdam: North-Holland, 1984), p. 98.
3. Hans H. Wellisch, *Indexing and Abstracting: An International Bibliography* (Santa Barbara, Calif.: ABC-Clio, 1980–84).

Indexing from A to Z. By Hans H. Wellisch. New York, N.Y.: Wilson, 1991. 461 p. $35 U.S. and Canada, $40 elsewhere. (ISBN 0-8242-0807-2). LC 90-26933.

This is a sturdy, handsomely bound volume printed on high-quality paper. The layout and design are especially attractive and, except for two production errors, are well executed: on page 102 the last two lines of text are misaligned, and in the index (page 430) the eleventh and following lines of the left column are misaligned at the subheading indention. Only three typographical errors were noted in the text: on page 69, the Romanization should read "Vsesoiuznyi"; on page 305, the example locators for "Sese Islands" under "Victoria Nyanza" should read 27, 34, 42; and on page 365, the euphonic "cameline" is meant to be "camel-like."

As the title suggests, the text is divided into ninety-one major topics that are presented alphabetically, A–Z (for Zen, to pique one's curiosity). The author has a clear and concise writing style, and humor is sprinkled throughout. Back-of-the-book indexing is covered as well as the indexing of periodicals and nonprint materials. References (in small capitals) throughout the text alert the reader to other pertinent sections of the book. Practical examples abound. A current and comprehensive bibliography of eleven pages follows the text.

For those who set great store by such facts as these, the thirty-nine pages of the index represent 8.7 percent of the indexable 447 pages of the book. Unfortunately, the benefit of a healthy-sized index is



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somewhat negated by a persistent inconsistency (and other ills).

The bibliography is indexed, but five of the twenty-two coauthors do not appear in the index. Other inconsistencies and problems noted include: many of the double entries do not have the same text or locators; full-form double entries are made for all initialisms except "BGN" (Board of Geographic Names); titles of books and periodicals are not consistently capitalized; two names ("BGN" and "IFLA") contain textual errors; some locators contain typographical errors; reference lists to related headings are not consistent (e.g., "filing" and "order of filing" lists); more than the "sensible" nine undifferentiated locators do appear ("Knight" has thirteen; "specificity" has eleven); "non-Western names" locators are grossly incorrect (see this subheading under "personal names"); related headings are not all grouped as subheadings under a main heading (e.g., "plural of 'index'" does not appear under "'index'"); no entry is made for Wynkyn de Worde (one of five notables on page 195); "brackets" in the index are used for the British term for parentheses (Americans should look under "square brackets"); and, most surprising of all, six headings and eleven subheadings are misfiled. Finally, traditionalist comma-lovers will chuckle over the typo in the "Rabelais" entry!

Despite the misadventures noted above, this volume offers comprehensive, exhaustive, and up-to-date information about a very complex subject. Especially valuable are references to current standards (some as then yet unpublished) and to their availability. This book should be of use to a wide range of readers and also can serve as a very good ready-reference sourcebook for libraries of all types and sizes.—*Eldon Tamblyn, Portland State University, Portland, Oregon.*

Information Technology and Library Management. Ed. by Ahmed H. Helal and Joachim W. Weiss. Publications of the Essen University Library, v.13. Essen: Universitatsbibliothek Essen, 1991. 233p. paper (ISBN 0-922602-14-2).

Serving as both a proceedings volume and a festschrift for Margaret Beckman, this book includes sixteen papers delivered at the thirteenth International Essen Symposium. The topics covered by speakers from Austria, Canada, Germany, Israel, the United Kingdom, and the United States include the impact of technology on librarians and library services; organizational and staff development issues; the next generation of information products; free or fee information services for small and developing countries; electronic books; multitasking and CD-ROM applications; the use of cooperative bibliographic utilities in German libraries; online searches in Austria; expert systems; and user education. Supporting materials include a preface (with biographical information about Beckman), lists of participants and vendors, and a summary by Philip Bryant.

As can be expected from any set of conference papers, the quality varies. All of the papers are informative, however, and a few (Hoffmann, McDonald, and Pastine) are excellent analyses of specific issues that research libraries are dealing with as information technology evolves. Lancaster's lead article is the most thought-provoking in questioning whether computer systems have had any significant effect on the quality of services that libraries provide. Paterson takes a novel approach by making analogies between the access issues of today and those of the medieval age, and De Kemp provides a preview of the technology we will use in the near future.

A primary value of this collection is its international scope. The specific examples cited indicate how Canadian, European, and Israeli libraries are addressing the issues of managing technology. The issues are the same as those in U.S. libraries, with only the names of the particular systems differing. All of the articles are in English, most include a bibliography, and a few have charts and illustrations. There is no index or record of questions or responses. This book is recommended for research collections in library and information science.—*Laverna Saunders, University of Nevada, Las Vegas.*

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Letter

From Bella Hass Weinberg, Associate Professor, Division of Library and Information Science, St. John's University, Jamaica, New York

The October 1991 issue of *LRTS* (vol. 35, no. 4) contained many interesting pieces, but I am writing to comment on two articles concerned with subject analysis.

I was very pleased to see Liu and Svenonius' paper[1] on the Dewey Online Retrieval System and its automatically generated chain index as the lead article because the relationship between classification and indexing is, I believe, underemphasized in the education of catalogers, and few library school graduates have any knowledge of chain indexing, in my experience.

I would like to take issue, however, with several statements in the article that contrast classification and thesauri. On p. 360, the authors state that "Classifications . . . go beyond thesauri by semantically structuring not only the vocabulary associated with concepts, but also the concepts themselves."

Since every classification notation representing a concept is associated with a feature heading, concepts are in all cases expressed by words. Where a single term does not exist in natural language to label a hierarchical level, many thesauri employ *node labels* containing phrases similar to those found in classification schedules.

The authors go on to state that "While thesauri consist of hundreds, perhaps thousands, of term clusters, classifications attempt to integrate these clusters into meaningful, monolithic wholes." It is true that *flat format* thesauri, i.e., those that provide broader term-narrower term information one step at a time, often consist of numerous clusters with few levels. Faceted thesauri, however, such as the *Art & Architecture Thesaurus*, or tree structures, such as those found in *Medical Subject Headings*, have about the same number of main classes as bibliographic classifications. The expressive notation assigned to the vocabulary of these thesauri allows for functionality identical to that of DDC online, e.g., browsing and explosion.

I also disagree with the authors' concluding statement in this regard: ". . . classifications can be said to partake more of the nature of a knowledge base than do thesauri." Aside from my objections to the use of the term *knowledge base* for *thesaurus*,[2] I believe that the major American bibliographic classifications (DDC and LCC) allow for fewer inferences than do rigorously structured thesauri because the primary facet in these classifications is *discipline*. Thus, for example, the feature heading "Children" associated with the DDC notation 331.31, which is subsumed under "Labor force" (331.1), does not permit the inference "a child is a laborer," only that this is the place where literature on the subject "child labor" is classed. Controlled vocabularies such as the *Art & Architecture Thesaurus*, in contrast, rigorously apply the "is a" test to all subordinate terms and employ postcoordination to represent complex concepts.

The second article in the October issue of *LRTS*, the study by Lancaster et al.[3] is simultaneously fascinating and sobering in light of its pessimistic conclusions regarding the possibility of improving subject access to online library catalogs. Although I question neither the authors' methods nor the inferences from the study, I would like to take issue with their proposed alternative to subject access in online catalogs: recommended readings by experts, based on encyclopedia articles.

There is considerable evidence from the research literature on information needs that scholars do not claim to have complete command of the literature of their own fields. The fact that the professors approached by the authors of the study for lists of recommended readings were reluctant to provide such lists confirms this. In a keynote paper presented at the October 1991 Annual Meeting of the American Society for Information Science, Kenneth Warren (substituting for Robert Maxwell) reported an overlap of only 4% in lists of "best" documents prepared by so-called experts in a given field; much of the quality literature is unknown to these experts.

After reading Lancaster's proposal, I encountered an encyclopedia article on "Design of Controlled Vocabularies."[4] Lancaster is the author of two editions of a book on the subject, the first of which I consider the bible of thesaurus design,[5] but neither edition is cited in the encyclopedia article. (An earlier article on "thesaurus" in the same encyclopedia (vol. 30) cites a review paper by Lancaster, but neither the later article nor the most recent subject index to the encyclopedia (vol. 47 s.v. *thesaurus*) links the two closely related articles.) *Encyclopedia of Library and Information Science* is the only multivolume encyclopedia in our field. Would Lancaster want us to rely on it exclusively for references to quality literature on vocabulary control?

The idea of users annotating online catalogs with their recommendations (mentioned in note 34 of Lancaster et al.'s paper) is appealing, but I have a counterexample to relate for this proposal as well.

The President of the American Society of Indexers suggested readings for beginning indexers in a recent issue of the Society's *Newsletter.*[6] A reader identifying himself as "a relative beginner" submitted a letter supplementing the original list to a subsequent issue of the *Newsletter.*[7] In his letter, he recommended a recently published textbook on indexing that, apparently unbeknownst to him, had received several scathing reviews (including one in *LRTS*) by acknowledged experts in the field. I then wrote to the *ASI Newsletter* to point this out,[8] the layman's recommendation? (I shudder to contemplate the malpractice implications of uncontrolled evaluations in online library catalogs.)

Librarians deal with—and compile—both comprehensive and selective bibliographies. One of the major purposes of a catalog is to identify *all* works in a collection that relate to a given topic, i.e., to produce a comprehensive bibliography, without evaluation. (Quality control should have figured in the library's selection process, if not the publication process.) While the development of online selective bibliographies is a worthwhile goal, we should not discard one of the original purposes of the catalog simply because current subject access methods are inadequate; we should instead attempt to improve them. I, for one, do not believe it is hopeless.

REFERENCES

1. Songqiao Liu and Elaine Svenonius, "DORS: DDC Online Retrieval System." *Library Resources & Technical Services* 35: 359–75 (1991).
2. Weinberg, Bella Hass, "Vogue Words in Information Science," *Bulletin of the American Society for Information Science* 16 (4): 15 (April/May 1990).
3. F. W. Lancaster et al., "Identifying Barriers to Effective Subject Access in Library Catalogs," *Library Resources & Technical Services* 35:377–391 (1991).
4. Svenonius, Elaine, "Design of Controlled Vocabularies," *Encyclopedia of Library and Information Science* 45 (Supplement 10) 82–109 (1990).
5. F. W. Lancaster, *Vocabulary Control for Information Retrieval* (Washington, DC: Information Resources Press, 1972).
6. Billick, David, "President's Column: That Perennial Question: 'How Do I Get Started in Indexing?' " *ASI Newsletter* no. 103:4–5 (Mar./Apr. 1991).
7. Bach, Steven, "Letter to the Editor," *ASI Newsletter,* no. 105:18 (July/Aug. 1991).
8. Weinberg, Bella Hass, "Letter to the Editor: What Books for Beginners?" *ASI Newsletter* no. 106:3 (Sept./Oct. 1991).

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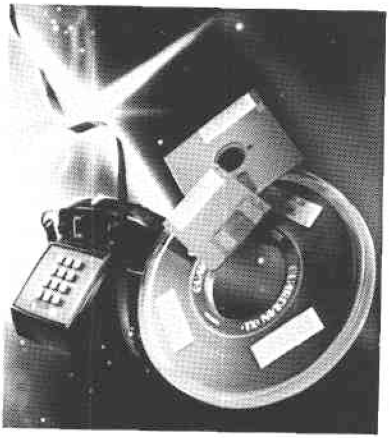

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